THE YEAR-BOOK OF TREATMENT

1898

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A CRITICAL REVIEW FOR PRACTITIONERS OF MEDICINE AND SURGERY

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PREFACE.

In this the fourteenth annual issue of the "Year-Book of Treatment" the aim has been, as heretofore, to present the busy practitioner with a readable digest of the progress made in the domain of therapeutics during the past year. The only changes in the staff of contributors are that Dr. G. A. Gibson, Lecturer in the Edinburgh School of Medicine, has supplied a review of the advances in the treatment of Diseases of the Heart and Circulation; and Dr. Herbert P. Hawkins, Physician to St. Thomas's Hospital, has dealt with Diseases of the Stomach, Intestines, and Liver.

It is hoped that the present issue will be found not less useful to the medical profession than its predecessors.

THE EDITOR.

January, 1893.

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THE

YEAR-BOOK OF TREATMENT FOR 1898.

DISEASES OF THE HEART AND CIRCULATION.

By G. A. Gibson, M.D., D.Sc., F.R.C.P., Edin.,

Senior Assistant Physician to the Royal Infirmary, Consulting Physician to the Deaconess Hospital; Lecturer on Medicine in the School of Medicine, Edinburgh.

During the year which has elapsed since the appearance of the last volume of the "Year-Book," one most important advance has been made in cardiac therapeutics, through the application of the serum treatment to endocardial disease. Beyond a doubt the employment of this method has been in the minds of many physicians as a possible means of averting the serious consequences of infective endocarditis, and the matter has now passed into the realm of achievement. In the following pages the subject is somewhat fully reported.

Echoes of the discussions held in preceding years on the mechanical treatment of circulatory diseases have still been heard, and some of the inevitable contributions on this subject have accordingly appeared. It cannot be said that any new facts have been brought out, but some of the criticisms which will be referred to in the sequel are not only of interest but of use.

The year has been distinguished by the appearance of Dr. Lauder Brunton's lectures on the action of medicines, in which there are some excellent directions in regard to cardiac therapeutics. The book is not merely of great value in discussing the effects of drugs, but it is most suggestive in many hints on practical therapeutics. Some of the subjects which are discussed will be referred to in the following pages.

The year has also been marked by the appearance of Sir William Broadbent's work on the heart, in which prognosis and

treatment occupy a very important place. It gives the results of wide experience and deep thought; his well-weighed opinions, therefore, are certain to be carefully considered. Several points on which he expresses strong views will, in the following pages, be referred to.

ACUTE CARDIAC DISEASES.

1. Serum therapeutics in acute endocarditis.

Harrington Sainsbury (*Lancet*, vol. ii., 1896, p. 1079) reports the case of a patient, aged thirteen, who was admitted to the Royal Free Hospital June 22, 1896, on account of cardiac pain. The boy had been ill for a fortnight before admission, the prominent symptoms being weakness, pyrexia, cough, and sleeplessness. There was no history of rheumatism or chorea. On admission the patient was obviously ill, of dusky complexion, with a dry skin, and a temperature of 103·2. The cardiac dulness was found as high as the first left intercostal space. The apex beat was in the fifth left space, 4 inches to the left of the mid-sternal line, at which point there was a well-marked thrill and double murmur. There was some evidence of pulmonary implication at both bases posteriorly. The liver and spleen were not palpable, and the renal secretion contained no albumin. The patient was treated by means of salicylate of sodium. Two days after admission he was quite delirious, and on the following day, although there had been no rigor, there was dulness over the left lung behind, with increase of vocal resonance and rusty sputum. These symptoms were followed by a symmetrical erythematous rash, spreading over the body, which lasted for five days. On July 1, streptococci were found in the blood. During the month which followed there were considerable fluctuations in the patient's condition, and by the beginning of August he appeared to be in a serious state, the temperature rising to 104·4, with vomiting and cough, attended with expectoration of blood-clot; there was also abdominal tenderness, and the spleen appeared to be palpable. During this period the patient was treated with perchloride of mercury. On August 17 the use of anti-streptococcic serum was begun, 20 c.c. being injected. The following day 10 c.c. were again injected, and two days later this latter dose was repeated. The temperature at this time was 99·8. The injections produced no local or general reaction. There was nevertheless a great improvement in the condition of the patient, so much so that, after two more doses of the same size as the last, he was up and walking about in the ward. The blood examined at this time was found to contain no streptococci. On September 1

a further injection of 10 c.c. of serum was administered, and was followed by slight local and general reaction, the temperature rising to 102, and the patient feeling ill and complaining of pain at the puncture. The temperature after this last injection remained normal. The condition continued satisfactory, and on the 14th the patient left the hospital.

In his remarks upon this most interesting case, Sainsbury contrasts it with another similar case under his care in the Victoria Park Hospital for Chest Diseases, about the same time, in which the anti-streptococcic serum absolutely failed to arrest the disease. The two cases cannot be regarded as in any sense parallel, as the one treated in the Victoria Park Hospital was at once more virulent and more advanced, while it was also complicated with grave kidney disease.

A. E. W. Fox (*Lancet*, vol. i., 1897, p. 520) reports the case of a man, aged thirty-six, who entered the Royal United Hospital, Bath, November 17, 1896, on account of pains in the back and limbs, attended by sensations of shivering. No morbid tendencies could be found in the family history, and he had previously suffered from no affection which could bear upon that for which he was admitted. Seventeen days before admission, after a rigor, he complained of pains, especially in the back, which, after the application of embrocations, disappeared. On admission he was found to have a pallid and muddy aspect, with traces of jaundice in the conjunctivæ. The temperature was 101·8, the pulse 100, the respirations 20. The tongue was slightly coated, white, and moist. The right radial artery did not pulsate, and a clot was made out in the middle third of the brachial artery, which was not tender. The anterior and posterior tibial arteries on both sides pulsated freely. The cardiac dulness began at the third left rib, and the apex beat was in its normal position. At the apex the first sound was double, and its second portion ended in a faint murmur. The second sound was clear and distinct. At the base a faint, soft, systolic murmur was audible. The spleen extended from the upper border of the eighth rib to the costal margin. The liver was slightly enlarged. No albumin was present in the renal secretion. On the 18th the temperature rose to 104·6, and there was profuse perspiration without rheumatic odour. On the 19th, 10 c.c. of anti-streptococcic serum were administered. The injection was not followed by any rash or other discomfort, but there was profuse perspiration. On the 23rd, two injections of 10 c.c. of the serum were administered, and similar injections were made every day thereafter. By the 24th, it was noted he was not quite so well, and

that the murmur at the apex of the heart was becoming louder and rougher. On the 25th, there was no pulsation in either of the tibial arteries, or in the popliteal artery of the left leg. Two days later he felt a little better. The systolic murmur at the base of the heart was on that day determined to be loudest in the aortic area, the second sound being short and sharp. Blood taken from the left arm was examined microscopically, as well as by cultivation, at the British Institute of Preventive Medicine, but no micro-organism was discovered. The injections were discontinued on the 29th, seeing that they appeared to have so little effect. As the temperature ran up to 103·6, and the patient became obviously worse, with delirium and sleeplessness, attended by diarrhœa, the injections were resumed on December 1. Cardiac failure ensued, with cyanosis and dyspnœa, and the patient died on the 2nd.

At the *post-mortem* examination, there was evidence of slight recent pericarditis. The heart weighed 14 oz. The right auricle and the right ventricle were dilated, but the valves were normal. The left ventricle was hypertrophied and dilated, but the mitral orifice was healthy. The aortic valve was invaded by a vegetation which almost entirely blocked up the orifice. The vegetation was about the size of a walnut, measuring 1 inch in length, and $\frac{3}{4}$ inch in breadth. It appeared to rise from the left posterior aortic cusp; but extended on to the surface of the anterior cusp. There was some atheroma of the aorta, but the coronary arteries were not blocked. The spleen and liver were much enlarged, weighing respectively 20 and 71 oz. The kidneys contained infarcts and were much congested. The vegetation contained numerous streptococci.

The *post-mortem* examination showed good reason for the want of success which attended the treatment of this patient, since the almost complete closure of the aortic orifice must have diminished the chances of recovery. Notwithstanding the want of success which attended the treatment in this particular instance, Fox states that he, from his own past experience of the futility of all other treatment, will certainly give a further trial to serum therapeutics.

Margaret Pearse (*Lancet*, vol. ii., 1897, p. 92) has also employed anti-streptococcic serum in a somewhat similar case. The patient had been suffering from dyspnœa, with acceleration of the pulse, and elevation of the temperature, before admission. After admission it was found that she had a fluctuating temperature, sometimes rising to 105. The pulse-rate was much accelerated. The area of cardiac dulness was increased to the

right. The aortic sounds were feeble, and there were mitral systolic and aortic diastolic murmurs, along with some pericardial friction. There was also some dulness of the right pulmonary base, and diminution of the breath sounds, probably from effusion. Under treatment during the first week after admission, the patient somewhat improved, the temperature falling from 103 to 100·4 in the evening and being normal in the morning. The pulse-rate fell from 114 to 84, and the respirations from 26 to 24. During this time the patient was treated by means of salicylate of sodium. The physical signs appeared to indicate that the disease was progressing, and during the second week an erythematous rash appeared over the face and limbs. During the week which succeeded, the temperature became higher, and the pulse was more accelerated. As the salicylate treatment appeared to be useless, it was decided to try the effect of treatment by serum. All other drugs were, therefore, discontinued, and 2·5 c.c. of anti-streptococcic serum were injected. There was no local or general discomfort. The following day a dose of 5 c.c. was administered, and on the third day the amount was doubled. Two days later 20 c.c. were injected, and the following day a dose of 10 c.c. was also administered. A considerable amount of erythema was present after this, and the administration was suspended for two days, after which 20 c.c. were injected. Considerable improvement in the condition of the patient followed, and two or three more administrations of the serum were had recourse to, the result of which was that the patient was discharged perfectly well. Unfortunately, no bacteriological examination of the blood was made until more than a fortnight after the use of the serum; yet there can be no reason for doubting the diagnosis of ulcerative endocarditis.

J. W. Washbourn (*Lancet*, vol. ii., 1897, p. 107) also records an instance of malignant endocarditis successfully treated with the serum, in the case of a girl aged 20, who was admitted to Guy's Hospital on account of headache, and of pains in the joints, where, however, there was no swelling or other disease. The affection ran a prolonged course, with an extremely variable temperature, reaching even as high as 105, and attended by frequent rigor and perspiration. There was some leucocytosis and diminished hæmoglobin. Treatment by means of quinine and salicylates produced no beneficial effects; the patient, in fact, became gradually worse. A pulmonary diastolic murmur was ultimately developed, which led to the diagnosis of ulcerative endocarditis. A few days thereafter injections of anti-strepto-

coccic serum were commenced, and were given daily, with the exception of three days, for two months. The doses were 20 c.c. until the last two weeks of treatment, when the amount was diminished. The treatment lasted, as Washbourn says, altogether nine weeks, during which time 1,030 c.c. of serum were injected in 59 doses. The general condition of the patient began to improve five or six days after the commencement of the injections, and three weeks later she was to all appearance quite well. When she left the hospital, almost six months after her entrance, she still presented the diastolic pulmonary murmur. In this case, unfortunately, as in the last, no bacteriological examination of the blood appears to have been carried out, and the anti-streptococcic serum was used simply because it was thought that the case was one of streptococcic infection.

The result of treatment of these four cases is certainly encouraging. Three of the patients made a perfect recovery, and the result is therefore to be regarded as one which will lead to the employment of the serum in those hitherto hopeless cases of disease.

2. Surgical treatment of pyopericarditis.

H. Bohm (*Deut. med. Woch.*, Bd. xxii., S. 769), after describing a case of suppurative pericarditis, taking its origin in pneumonia following influenza, in which, after the failure of internal remedies to produce any benefit, recovery occurred upon free opening of the pericardial sac, pleads for the treatment of this affection by incision. He points out that of fifteen instances on record eight recovered and seven were fatal.

THE TREATMENT OF CHRONIC HEART DISEASE.

1. Cardiac failure.

In an important paper on the treatment of chronic cardiac inadequacy, **F. Neumann** (*Berl. klin. Woch.*, 1897, S. 376 and S. 405) calls attention to instances in which chronic disease of the heart had existed for even forty years, and emphasises the importance of a simple mode of life, with which such patients may live long without diminishing their activity. He is of opinion that digitalis is the most important remedy, and the method of administration is to employ large amounts in brief periods. When there is any sclerosis of the vessels and cardiac degeneration, he combines iodide of potassium with digitalis in the form of infusion, and finds that it has a very beneficial action on the heart, the pulse, and the secretions. In cases where there is cardiac degeneration, with little or no arterial sclerosis, he finds the iodides sometimes worse than useless. The effects found from the

use of strophanthus have not been equal to those obtained with digitalis; but he admits that since obtaining a better preparation of the former he has had more successful results. Most other so-called cardiac tonics are in his view useless. Of these he signalises caffeine as an example. The paper goes on to refer to the importance of nitro-glycerine in chronic cardiac disease, as well as of iron when the condition of the digestion will permit of it.

2. The importance of diet.

Shortly before his death **M. J. Oertel** published (*Zeitsch. f. Krankenpf.*, xviii., S. 1 and 25) an important paper upon diet in chronic diseases of the heart, in which he emphasises the overwhelming importance of suitable food in the treatment of such affections. He urges the selection of articles of food, and the regulation of the size and number of meals, in order to obtain the highest nutrition with the least possible disturbance, so that the cardiac energy and the vascular relations may be, as far as possible, improved. He says, somewhat sarcastically, that the careful supervision of such matters is of far higher importance than the administration of a few drops of digitalis or strophanthus, or the employment of a few carbonic acid baths.

3. The methods of Schott and Oertel.

H. N. Heinemann (*Deutsche med. Woch.*, xxii., S. 525) strongly urges the importance of the Schott methods of treatment, from observations made in Nauheim upon seventy-six cases, as the result of which he believes that there is not merely temporary relief but permanent improvement. He is of opinion that neither the baths nor the exercises by themselves are of so much value as the combination of both methods.

W. H. Broadbent's views ("Heart Disease," p. 92 and p. 325) as regards the Oertel and Schott methods of treatment are well worthy of careful consideration. With reference to the former, he holds that in cases of valvular disease, in which compensation has completely given way, the treatment is certainly not advisable, and in many cases would be impossible. When, however, compensation has been established or restored, gentle climbing exercise in fresh, rarefied air will certainly do more to develop further compensatory hypertrophy of the heart then mere walking on the level. It is more especially in cases of fatty accumulation, without fatty degeneration of the cardiac muscle, that the treatment by dieting and systematic muscular exercise may be of real service.

After stating the theory of Schott, that the heart is stimulated by a reflex process so that its contraction becomes more complete

and forcible, as a result of which the heart muscle undergoes hypertrophy, and so becomes competent to cope with the extra work thrown on it by the valvular lesion, Broadbent expresses the view that it is more probable that the baths and movements give rise to a physiological dilatation of the capillaries in the skin and muscles respectively, so that the resistance to the onward flow of blood is lessened, and the left ventricle, thus relieved, is able to complete its systole. He admits, however, that the chief objection to this theory is the slowing of the pulse which occurs in the bath or during the exercise, as diminished peripheral resistance would tend to accelerate the pulse. He allows the possibility that slowing of the pulse may be attributable to reflex stimulation of the vagus.

In summing up the results of treatment by baths and exercise, Broadbent allows that the method may give relief and greatly modify the symptoms in suitable cases of valvular disease; but that it is not to be regarded as applicable to, and infallible in, all varieties and conditions of *morbus cordis*, or as a substitute for all other forms of treatment. In cases of cardiac dilatation from loss of tone of the heart muscle, after influenza, or some other depressing disease, it may be of great service and an effective remedy where drugs and other treatment fail. In many cases of functional and neurotic heart disease, it may also give satisfactory results. In valvular disease it is unnecessary when compensation is established and no symptoms are present. When compensation has completely broken down, it is not advisable, as rest in bed and suitable treatment by other means will be more efficacious. In cases of mitral disease, more especially of obstruction, when compensation is maintained with difficulty, it may be of great service. In aortic disease it is not advisable, owing to the risk of syncopal attacks, though when compensation is breaking down, and the mitral type of symptoms is present, it may sometimes bring about good results.

In an appendix dealing with the methods employed in the Schott treatment of heart disease, Broadbent states further that the mere fact of a patient having heart disease should not be a signal for its immediate employment. When compensation is perfect no special treatment is required, and in a large proportion of cases of valvular and muscular disease the value and efficacy of this treatment are doubtful, equally good or even better results being obtainable by other means. The best results of this treatment are to be seen in cases of functional or imaginary heart disease in neurotic individuals. It is impossible not to agree with Broadbent in the final sentence of his work: "The practice

of placing in the hands of the patient elaborate diagrams to illustrate the supposed diminution in the size of the heart after a bath is to be deprecated."

Lauder Brunton's views ("The Action of Medicines," pp. 353 and 368) as regards the treatment of heart disease by baths and exercises are by no means similar to those of Broadbent, inasmuch as he writes almost enthusiastically of these methods in the treatment of certain cases. He has appended to his lectures dealing with this subject, just as is done by Broadbent, a description of the various resistance exercises which are employed. It is impossible, however, to regard the diagram which he gives, showing the reduction of the cardiac dulness after a bath, as being very true to nature.

A. Bum (*Wien. med. Presse*, xxxvii., S. 281 and S. 320), in an important contribution to the treatment of circulatory disorders by mechanical means, points out that as the result of increased muscular action there is an elevation of the blood pressure, after which it falls to a lower level than previously, and finally comes to the normal. He agrees with Hasebroek that the initial rise of pressure must have its origin in increased activity of the heart. The performance of increased work in resisted movements is only possible for the heart in systole if the work of the heart in propelling the blood can be permitted by a lowering of the peripheral resistance. Methodical movements of the muscles are able to lower the resistance in the systemic circulation in a reflex manner, as well as to increase the activity of the heart and favour the return of venous blood. The author is, therefore, strongly of opinion that in massage and gymnastics there are means of powerfully increasing the return of venous blood. These opinions lead him to advocate the employment of such therapeutic methods, with careful attention to the general condition of the patient, as well as to the character of the circulatory disturbance.

4. The uses of massage.

J. Zabludowski (*Berlin. klin. Woch.*, 1896, S. 435) emphasises the usefulness of massage in chronic affections of the heart. After pointing out that patients with feeble hearts not infrequently collapse under the effects of active and resisted exercises, he shows that the various passive movements included under the term massage are of benefit. Massage often within a few days renders a previously frequent and small pulse larger and less frequent, while palpitation and oppression are reduced, and the improvement is accompanied by better sleep and spirits. The author has also observed excellent results from massage in

circulatory neuroses; in sclerosis of the coronary arteries, the diagnosis of which, by the way, he does not specify; in hypertrophy from over-eating and drinking, weakness of the heart after influenza, and in cases of Graves's disease. He holds that along with digitalis it constitutes an active means by which, often in a very short time, the heart may be quieted and steadied; while, at the same time, the peripheral resistance is diminished. The process must be begun gently, and the cardiac region must at first not be disturbed. After the circulation has been stimulated it is not necessary to restrict the method to any particular part of the body, but general massage may be adopted. Stimulation of the nerves of the back, of the neck, and of the intercostal spaces, as well as of the vagus through percussion, constitutes an important part of this general massage, and considerably increases its action.

RECENT PHARMACOLOGICAL ADVANCES.

1. The effects of baths.

The influence of cool baths upon the circulation in health has been carefully investigated by **A. Breitenstein** (*Arch. f. exp. Path. u. Pharm.*, Bd. xxxvii., S. 253), who has carried out a very large number of observations on this subject. Although his work does not bear directly upon the treatment of circulatory affections, yet it is of importance to notice that he observes an increase in the force of the heart, and a diminution of blood pressure in the veins, so that the rapidity of the circulation is increased, and any tendency to stasis l essened. He is of opinion that the cold bath exerts an immediate reflex effect on the heart and the blood vessels, while, at the same time, the deeper respirations antagonise stasis in the great veins.

2. The actions of digitalis.

Arthur Cushnie (*Journ. Exp. Med.*, 1897, vol. ii., p. 233) has investigated the action of substances belonging to the digitalis group. Strophanthin, digitalin, antiarin, erythrophlœin, and convallamarin were the drugs more particularly investigated. Some of the observations were carried out simply by watching the movements of the heart, but more accurate observations were made with the myocardiograph and the cardiometer. By means of these methods he has been able to test the work of previous observers, and to criticise the opinions which they have expressed.

He has been led to the conclusion that in producing their effects on the cardiac muscle all these drugs have an action which is identical, but that they differ considerably in their relative strength; on the other hand, their effects upon the blood vessels

are much more variable. They also differ very widely in their relative action on the cardiac muscle and the nervous apparatus. According to the author, the action of digitalis may be divided into two stages, of which the first is marked more by nerve inhibitory action than by changes in the cardiac muscle; while the second shows less inhibitory action and more muscular effects. The inhibitory effects are brought about by direct stimulation of the vagus nerve, both in its central apparatus in the medulla, and in its peripheral distribution to the heart; while the cardiac muscular effects are manifested by increased extent of systole, and in some cases diminished diastolic relaxation. When larger doses are administered, the irritability of the muscle is considerably increased, and there may be a development of the spontaneous rhythm of the ventricles. The result in the first stage is to give diminished frequency of cardiac action, with more complete ventricular contraction, and, as a rule, increased diastolic relaxation—this latter phase may, however, be unchanged or even diminished. The auricles sometimes do not contract with so much force and perfection, but the opposite condition was sometimes observed, and they usually undergo a more complete relaxation than is normal. There is increase of systolic pressure and augmentation of the amount of blood ejected from the heart. These effects, added to the contraction of the arterioles, produce increased pressure and acceleration of the systemic circulation, perhaps a rise of pressure in the great veins, which is only transient, if it occurs at all, and possibly also augmented pressure of a temporary kind in the cardiac cavities during diastole. Cushnie found that the pressure in the pulmonary artery is scarcely affected by some drugs belonging to the group, while it is increased by others, and he concludes that these effects are due to the action of the poisons on the peripheral arteries, not on the heart. When the action of the vagus is very strong, there may be more slowing of the heart, while the ventricles beat spontaneously, and lose their relationship to the auricles. A diminution in the amount of blood ejected may be produced by the retardation of the heart, and the blood pressure even may fall to a considerable degree. The ventricles, however, do not lose their associated activity, although they become irregular from variations in the length of the pause.

The second stage is marked by acceleration of the action of the heart from increased irritability of the muscle fibres, and the ventricles have frequently a spontaneous contraction. Occasionally the auricular and ventricular movements interfere with each other, and, by the passage of impulses in either direction, give

rise to irregularity. It is of interest to observe that the two ventricles maintain their common rhythm throughout, although the auricles may contract at quite a different rate. The inhibitory nerves lose their power of retardation, the output of blood undergoes extreme variations, and the blood pressure falls to a great degree. The auricles, as a rule, cease to contract before the ventricles fail, but this is not an invariable experience. The heart comes to a standstill in the diastolic phase.

The author, finally, seeks in these effects for an explanation of the results obtained by the use of digitalis in the treatment of disease, and is led to the conclusion that the beneficial effect must be attributed for the most part to its direct cardiac action. The early part of the first stage alone can be held as of use in therapeutics. In dilatation of the ventricle, there is a much less complete systole than there should be, and some residual blood remains behind. An increase of the systole leading to expulsion of all the blood, such as is produced by digitalis, is of the greatest value in such conditions. It is possible that the diastole in such cases is not so great, but this cannot be regarded as certain. If there should be any incompetence, an increase in the contraction of the ventricle during systole will have a tendency to diminish the irritation, and thus lessen the regurgitation. The papillary muscles at the same time act more powerfully and diminish the incompetence of the valve. The auricles do not seem to be affected by digitalis to such an extent as to produce any effects upon the circulation; but Cushnie frankly admits that he is not quite certain about this point. The increased contraction of the ventricle has the same compensatory effects in dilatation and incompetence on the right side of the heart, just as in the case of the left, and this is the case whether the right side suffers from affections of the left side of the heart, or from affections of the lungs. It appears to be established that digitalis has much more tendency to increase the resistance of the flow of the blood through the lungs than is the case with strophanthus. Possibly the latter drug may therefore be more useful in dilatation of the right ventricle as a consequence of pulmonary conditions than the former. In pneumonia the effect of digitalis may be due to its acting as an antagonist to the toxins of the disease.

Brunton and **Tunnicliffe** (*Journ. of Physiol.*, 1896, vol. xx., p. 354) have made some investigations upon the vexed questions connected with the action of digitalis on the vessels. Their method consists in (*a*) inhibiting the heart for an equal period of time under ordinary conditions, and after injecting digitalis; and (*b*) comparing the rate and extent of the ensuing fall of blood

pressure in the carotid in these two cases. It is obvious that if the heart is arrested for the same length of time in both cases, the extent of the fall of blood pressure as well as its rate will depend on the pressure at the time of arrest—*i.e.* on the state of contraction of the peripheral arterial system. The results obtained were strongly in favour of a distinct effect on the arterial system. Without previous administration of digitalin, the pressure of a rabbit, on inhibition, fell from 50 to 13 mm. Hg., thus showing a fall of 37 mm. After the administration of digitalin, the blood pressure in the same animal fell from 58 to 32 mm., or 26 mm. The lessened rate of fall, under increased pressure, can, in the opinion of the observers, be produced only by stimulation of the peripheral vessels.

3. The effects of digitalis.

Upon the use of digitalis **Broadbent**, in his recent work (*op. cit.*, p. 112), expresses sound opinions. "It is too commonly taken for granted," he says, "that the existence of valvular disease constitutes an immediate indication for the administration of digitalis; but to make the discovery of a murmur the signal for giving digitalis is fatal to anything like precision in treatment, and may deprive the sufferer of the advantage to be derived from this remedy when it is really needed. The special indications for its use are frequency, weakness and irregularity of pulse, and œdema of the extremities, with scanty, turbid, concentrated urine. When these are absent, it is rarely of service, but even when the symptoms begin to show themselves gradually, or occasionally on slight provocation, it will be well to combat them at first with strychnine, iron, quinine, and general tonics, rather than resort at once to digitalis, the salts of potash and any suitable diuretic being employed to promote secretion. When the use of digitalis is called for, the most trustworthy evidence of its beneficial effects will be increase in the secretion of urine, with an improvement in the tone and vigour of the pulse, as well as more regular and less hurried action of the heart. When there is no response in the form of diuresis, the pulse and general symptoms must be carefully watched lest harmful effects should occur."

In connection with this subject it may be noted that the author speaks very strongly in favour of the combination of digitalis with nux vomica, as well as of the almost classical union with mercury and squills; and he further advises the use of a mercurial aperient before the exhibition of digitalis, to be repeated from time to time. Broadbent is of opinion that convallaria is not of great service; he holds that strophanthus may be most useful when digitalis produces sickness, and may even

succeed where digitalis has failed. In his opinion caffeine has been a most useful accessory to digitalis, but he has not found that it is an efficient substitute for it.

Broadbent in discussing the physiological action of the group of cardiac stimulants, maintains that their effect is a stimulation of the muscular fibres of the cardiac and vascular system, giving rise, on the one hand, to more deliberate action of the heart, and on the other, to tonic contraction of the arterioles and capillaries. This he believes to be produced by a direct action upon the muscular structures, and not, therefore, by an indirect influence upon nerves. Arguing from these physiological effects, he thereupon discusses their therapeutic action. He lays particular stress upon the more complete expulsion of the contents of the heart by the energetic contraction of the ventricles, which thereby fills the arterial side of the circulatory system; and upon the important suction action during diastole which will lead to withdrawal from the veins of the blood stagnating in them. He further emphasises not only the effectiveness of the systole, but the renewed vigour of the heart through the increased physiological rest from prolongation of the diastole. The primary effect, no doubt, of the tonic contraction of the arterioles is to increase the resistance in the peripheral circulation, and it is therefore conceivable that under certain conditions, such as serious cardiac degeneration, the contraction may more than neutralise the increased force of the systole. As, however, there is in most cases some considerable hypertrophy of the muscular walls of the heart without any corresponding hypertrophy of those of the vessels, the balance of advantage is largely on the side of the heart. Replying to a feasible argument that the contraction of the arterioles might diminish the force of the current passed on to the veins, he submits that the contraction affects also the capillaries, and that the narrowing of their channels will increase the rapidity of the current of blood within them, so that more propulsive force will be communicated than through a network of flaccid, dilated, and bulging capillaries. This increased flow will also favour the absorption of fluid from the intercellular spaces.

Broadbent thereafter seeks to explain why the drug is not, as might be expected, of equal service in all forms of heart disease, excepting structural degeneration. It is universally agreed that, in mitral incompetence, digitalis is of the greatest service, and there is almost equal concurrence of opinion that it is not of so much use in mitral obstruction; while in aortic diseases there is a conflict of views as to the effects obtained from cardiac tonics. Broadbent points out that the discussion of

digitalis is often carried out on theoretical grounds, and he calls attention to the fact that it is upon experience that the conclusions which have just been referred to are based. The differences in the effects of digitalis were known long before its physiological action was ascertained. He points out that when mitral obstruction was not distinguished from incompetence, the varying effects of digitalis must have been very perplexing. He further suggests that, in aortic regurgitation, failure of compensation may occur in two different ways: in the one, from defective propulsion of blood into the arteries, in which death occurs by syncope; in the other, from backward pressure upon the lungs and right heart. There are, as he puts it, "aortic physical signs with mitral symptoms." In the former of these cases he regards digitalis as of uncertain and sometimes, indeed, of grave effects; in the other, digitalis frequently acts as well as in mitral incompetence. In the same way, as regards aortic obstruction, he regards digitalis as useful when there are pulmonary symptoms; while if there be a limited supply of arterial blood, he considers that more relief may be obtained from the use of nitro-glycerine. Broadbent is of opinion that the favourable results of cardiac tonics in mitral regurgitation are due almost entirely to a reinforcement of the right ventricle. He states that among the conspicuous favourable results of digitalis is diminished irregularity of the pulse, which beneficial effect is entirely due to the higher blood pressure in the left auricle. He holds that mitral incompetence is the one among valvular affections which is specially liable to irregularity of the pulse, and that this is brought about by the varying conditions of pressure within the thin walls of the left auricle. The effect of digitalis, therefore, in diminishing variations of pressure within the auricle is to steady the heart and render the pulse more regular.

As regards the effects of digitalis in mitral obstruction, Broadbent is of opinion that as the left ventricle in uncomplicated cases is neither dilated nor hypertrophied, while the arteries generally are small and contracted, there can be no advantage in further constriction of the arterioles; the symptoms rather are removed by producing dilatation. Moreover, no great increase in the output of blood is to be gained by more vigorous contraction of the walls of the left ventricle; while, further, an increased stimulation of the right ventricle may simply lead to embarrassment. Seeing that the blood cannot be forced through the orifice in mitral stenosis beyond a certain rate of speed, the usefulness of the drug is restricted.

4. Digitalinum verum.

P. Deucher (*Deut. Arch. klin. Med.*, lvii., S. 1), in order to have a means whereby it might be possible to obviate some of the disagreeable effects of digitalis, has pursued some careful investigations on digitalinum verum. The theoretical benefit which might be expected from the subcutaneous use of this remedy has not been realised in practice. The preparation is greatly inferior to such a substance as infusion of digitalis, and it even produces serious local effects. Deucher, therefore, concludes that digitalinum verum is only indicated in such cases as have been found to be unsuitable for the use of the ordinary preparations of digitalis.

5. Antagonistic action between digitalis and nitrites.

C. R. Marshall (*Journ. Phys.*, 1897, vol. xxii., p. 1) has investigated the antagonistic effects of digitalis and some of the vaso-dilators. The employment of digitalis combined with nitrites was, several years ago, suggested by Huchard, and although no experimental light has been thrown upon the matter, the combination has been largely employed by practical physicians. The author is of opinion that the action of digitalis is a chemical one on the myoplasm of the cardiac cell itself. The effects of stimulation of the inhibitory and accelerator nerves may be produced in the early stages, but whether these result from changes brought about in the contractile substances, or whether they are due to a true stimulation of the inhibitory and accelerator nerves, apart from the muscle cells, is a debatable point. As all observers are agreed that an effect on the muscular substances exists in all phases of digitalis action, and as this is almost the only effect desired in practice, this influence for the present must be regarded as predominant. On the blood vessels digitalis exerts a powerful constricting influence, probably a direct one on the muscular tissue in their walls. He regards the nitrites, on the other hand, as being also muscle poisons, with effects entirely different from those of digitalis; they dilate the vessels by acting directly on their walls, in consequence of which the heart beats more rapidly. The nitrites also have a depressing effect on the cardiac muscle, and they are therefore in every way antagonistic to digitalis. From the careful investigation of the combined action of the two classes of drugs, which were carried out by means of kymographic, perfusion, and sphygmographic experiments, as well as by examination of the renal secretion, Marshall has come to some interesting conclusions. Digitalis and the nitrites are antagonistic as regards effects on blood pressure, each drug partly counteracting the effects of the other. The nitrites are believed,

under all conditions, to produce a reduction of blood pressure; and digitalis employed during the action of the nitrites can always to some extent, at any rate, raise the pressure of the blood. If the two drugs are administered at the same time, the vaso-dilator action is principally seen probably from the more rapid action of the nitrites. The pulse is not by any means so much retarded as when digitalis is given by itself. Even after the production of irregularity of the heart by means of digitalis, the nitrites will often remove the symptoms for a time. The conclusion from observations on the vessels and the heart are that the drugs are mutually antagonistic, the resulting effects depending on the excess of either substance.

The observations on the renal secretion were carried out on rabbits, and the result of the experiments was to prove the generally accepted view that digitalis produces in health a diminution rather than an augmentation of the secretion. Marshall, however, finds that nitro-glycerine acts as a diuretic after a return of blood pressure to normal, and he concludes that the combination of the two substances is more powerful in this direction than nitro-glycerine alone. When the blood pressure is reduced by nitro-glycerine, the secretion is greatly diminished, but when digitalis has been administered before so as to lessen the fall of pressure, the diminution was extremely small. It is to be remarked that sodium nitrite does not produce so much effect as nitro-glycerine.

The human pulse observed by means of the sphygmograph showed that the nitrites were more powerful in antagonising digitalis than the converse. Digitalis has undoubtedly some effect on the action of the nitrites, but in the main it does not greatly influence their action; while, even after large doses of digitalis, the action of the nitrites is easily produced. Marshall regards the antagonism as being produced through the muscle cells by chemical action, and the toxic effects of either drug are not lessened by their antagonistic action, as seen in the heart of the frog.

ARTERIAL DISEASES.

1. Arterio-sclerosis.

Groedel (*Wien. med. Woch.*, 1896, S. 665 and S. 727) considers that apprehensions with regard to the treatment of arterial sclerosis by means of baths are destitute of foundation, and expresses the opinion that their effect, by stimulating metabolic processes, is beneficial. He holds that hot brine baths containing carbonic acid act as tonics upon the heart after it has undergone weakening

in consequence of arterial sclerosis. He admits, however, that there are certain contra-indications, such as apoplexy and other brain affections. There is some unconscious humour about this paper which renders it most amusing.

2. Treatment of aneurysm by means of wire and electricity.

A successful case of treatment of an aneurysm of the innominate artery has been reported by **Hershey** (*Therap. Gazette*, vol. xx., p. 590). The method of treatment was the puncture of the aneurysm by means of a needle, and the introduction of gold wire of 14 carats. It had been intended to insert sufficient wire to fill the cavity, but after 2½ feet had been employed the wire became bent and no more could be introduced. It was, therefore, cut short and attached to the positive pole of a battery, while the negative rheophore was applied to the back of the neck. A current of 70 milliampères was in this way conducted through the sac. For three-quarters of an hour the aneurysm underwent no change, and the needle showed free pulsations, but after this the appearances changed, and the galvanometer showed only a current of 60 m.a. The movements of the needle gradually became less, and the current fell to 40 m.a., while the mass began to feel hard to the touch. The patient made an excellent recovery, and has been able for his work ever since.

CIRCULATORY NEUROSES.

Exophthalmic goitre.

F. Berndt (*Arch. klin. Chir.*, 52, S. 709), in reporting two cases of Graves's disease, both of which made a complete recovery after removal of part of the thyroid gland, makes some reflections upon the rationale of the treatment without coming to any definite conclusions. He is inclined to regard the affection as a primary central neurosis caused by the mechanical effects produced by the pressure of the enlarged thyroid gland upon the sympathetic.

DISEASES OF THE LUNGS AND ORGANS OF RESPIRATION.

By Gustave Schorstein, M.A., M.B. Oxon., F.R.C.P., D.P.H.,
Assistant Physician to the London Hospital, and to the Hospital for Consumption, Brompton.

A.—Pulmonary Tuberculosis.
- I.—Preventive measures.
- II.—The diagnostic value of Koch's original tuberculin.
- III.—The new tuberculin.
- IV.—Serotherapy.
- V.—Special drugs and methods.
  - (1) Guaiacolate of piperidine.
  - (2) Oxytoxins.
  - (3) Camphoric acid.
  - (4) Eucalyptus oil and oil of cinnamon.
  - (5) Eosote.
  - (6) Peronin.
  - (7) Röntgen Rays.

B.—Pneumonia.
- I.—Serotherapy.
- II.—Large doses of digitalis.
- III.—Formate of sodium.
- IV.—Creasote.

C.—Whooping Cough.
- 1.—Ozone.
- 2.—Exalgin.
- 3.—Resorcin.

D.—Chronic Bronchitis.

A.—PULMONARY TUBERCULOSIS.

I.—PREVENTIVE MEASURES.

There has been a very healthy activity during the past year in regard to the development of preventive measures against tubercle. The knowledge that tuberculosis is very largely a preventible

disease, not hopelessly due to heredity, is slowly becoming diffused. But we are a long way yet from the general recognition of the fact. The most interesting report of what can be done is contained in **Hermann Biggs's** address on Public Medicine at the Montreal meeting of the British Medical Association. It is of such general importance that it is worth quoting *in extenso*.

"The Health Board of New York City first began an educational campaign in relation to the causation and prevention of pulmonary tuberculosis in 1889. In that year a communication on this subject presented by the writer and the associated Consulting Pathologists of the Department was widely published, and leaflets based on it, giving the essential facts as to the nature of this disease, were freely distributed. No further action was taken at that time, as investigation showed that the medical profession and the public were not then prepared for more extended measures. In December, 1893, the attention of the Department was again called to the subject by the writer, and it was determined at once to institute more comprehensive measures for the prevention of this disease. The measures then adopted required the notification of all cases of pulmonary tuberculosis occurring in public institutions, and requested reports of cases occurring in the practice of private physicians. They also included arrangements for the bacteriological examination of sputum, to assist in the early diagnosis of this disease; the inspection of all reported cases in tenement houses, lodging-houses, hotels, and boarding-houses, and the instruction of the patients and their families as to the nature of the disease and the means to be taken for its prevention; the inspection of the premises in all instances where deaths were reported as due to tuberculosis, and the issuing of orders, when it was deemed necessary, upon the owners of apartments which had been occupied by consumptives and vacated by death or removal, requiring that such apartments be thoroughly renovated, by cleansing and by painting, papering or kalsomining, before they were again occupied by other persons; and, finally, the education of the public by wider and more comprehensive methods as to the nature of this disease.

"Placards were attached to the doors to prevent the reoccupation of apartments which had been vacated by death or removal before the orders requiring renovation had been complied with.

"Under the resolutions by virtue of which these measures were enforced, 4,166 cases of tuberculosis were reported in 1894, 5,818 in 1895, and 8,334 in 1896. So far as was possible, all of these cases, except those in private houses, were visited or the premises where they had lived were inspected, and, in addition, the premises occupied by persons dying from tuberculosis (numbering each

year 6,000) were inspected, and such action taken as was considered possible and desirable. Altogether the premises and cases thus coming under observation during these three years numbered more than 35,000.

"These facts convey some idea of the enormous sanitary importance of the subject. It is conservatively estimated that there are at least 20,000 cases of well-developed and recognised pulmonary tuberculosis now in New York City, and an additional large number of obscure and incipient forms of disease. A very large proportion of the former cases constitute more or less dangerous centres of infection, the degree of danger depending in each instance upon the intelligence and care which are exercised in the destruction of the expectoration. All the suffering and death consequent upon the prevalence of this disease, in view of modern scientific knowledge, are largely preventible by the careful observation of simple, well-understood, and easily applied measures of cleanliness, disinfection, and isolation.

"In the beginning of 1897 the Health Board further adopted some recommendations made jointly by **Dr. T. Mitchell Prudden,** Consulting Bacteriologist to the Health Department, and the writer, which advised that pulmonary tuberculosis be declared to be an 'infectious and communicable disease, dangerous to the public health, and which required the notification of all cases occurring in the city,' in the same way as is required with regard to typhoid fever, diphtheria, and other similar diseases. Tuberculosis, however, in accordance with the special section of the Sanitary Code enacted to provide for these measures, is distinctly separated from the eruptive diseases, is not classed with them as a contagious disease, but is referred to as an 'infectious and communicable disease.' *It has always appeared to the Health Board exceedingly desirable that a broad distinction should exist in the public mind between this disease and the diseases which are more properly classed as contagious.*

"In the treatment of apartments which have been occupied by tuberculous patients, and vacated by death or removal, renovation has been, and is, ordered rather than disinfection attempted, because the Health Board has always felt that disinfection for tuberculosis in the poorest tenement houses was too difficult to be performed satisfactorily, and has considered renovation as certainly efficient. In the thousands of orders requiring the renovation of premises which have been issued under the resolution referred to upon the owners of real property during the last four years, little or no difficulty has been experienced in enforcing compliance, and rarely has there been serious objection.

"Public institutions, hospitals, asylums, homes, etc., are now not only required to report the name, last address, sex, age, and occupation of every case of tuberculosis coming under observation, within one week of such time, but they are further required to notify the Department of the discharge or transfer of such patients. The purpose of this procedure is to keep under more or less constant supervision those cases of pulmonary tuberculosis which occur among the poorest classes of the population; in other words, those which are most likely to be dangerous sources of infection to others. Unfortunately, at the present time there are no hospitals directly under the control of the Health Department for the care or isolation of cases of pulmonary tuberculosis; but it is hoped that such hospitals may be soon provided.

"The best medical opinion forbids that persons suffering from pulmonary tuberculosis be treated in association with other classes of cases in the general medical wards of general hospitals. This opinion is based on the daily observation of the dangers incident thereto, and it has very properly resulted in the exclusion, to a large extent, of persons suffering from this disease from many of the general hospitals to which they were formerly admitted.

"A large experience has also shown that in institutions devoted solely to the care of consumptives the general welfare of the patients is more easily fostered, the risks of fresh infection are more certainly diminished, and the chances for recovery are more surely enhanced than in general hospitals, in which all classes of cases are received.

"From the beginning of this work, the officials of the Health Department of New York City have encountered, in the lack of proper facilities for the care of consumptives, a great obstacle to practical success, and I am convinced that the grave responsibilities which rest upon sanitary authorities generally in this matter cannot be properly discharged without the establishment, under their direct control, of additional special hospitals for the care and treatment of this disease. No week passes in which the officers detailed to this work in New York do not encounter many instances in which the members of many households, numerous inmates of crowded tenement houses, employees in dusty and unventilated workshops, and many others, are dangerously exposed to infection from victims of this disease, who cannot gain admittance to the overcrowded public institutions, or who reject all proffered assistance and instruction, and, from ignorance, indifference, or inability through weakness due to the disease, scatter infectious material broadcast, thus diminishing their own

chances for recovery and imperilling the health and safety of others. In such cases sanitary suggestions are futile, and removal to a hospital constitutes the only effective action. I am convinced that no factor is so potent to-day in perpetuating the ominous death list from pulmonary tuberculosis as the lack of proper facilities for the adequate care of the poor stricken with this malady :—

"The measures designed for the prevention of tuberculosis properly include not only those which relate to the transmission of the disease from human beings to each other but also those which relate to the transmission of the disease from affected animals, especially the bovine species, to human beings, through the meat and milk used as food. The Health Department of New York City, while feeling strongly that the most important source of infection is through the sputum of consumptives, has yet elaborated with great care methods for protecting the public, so far as lies within its power, from infection by the meat and milk of tuberculous animals. In order that a more effective control of the milk supply should be possible, an ordinance was passed in 1895 forbidding the sale of milk within the city without a permit from the Health Department, and requiring that all waggons used for transportation or delivery of milk should likewise have waggon permits. Before these permits are issued, the holder of the permit must furnish information as to the source from which the milk is obtained, the number of animals, the character of the food supply, and the sanitary conditions surrounding the dairy. Special regulations have been established with regard to the sale of milk, and permits may be revoked at any time by the Health Board, where evidence exists that the regulations have not been strictly complied with. All milch cows in New York City (about 3,000 in number) are now being subjected to the tuberculin test, under the supervision of the Health Department, and animals found to be diseased are killed. It is proposed, as soon as this work is completed in New York City, to require similar tests to be applied to all cows whose milk is sent to New York City. There also exists a careful inspection of animals slaughtered for food, and of all meat sent into the city, and the carcases of those found to be tuberculous are destroyed.

"Most beneficial effects have already resulted from the various measures instituted for the prevention of this terrible disease. Not only has there been a very material decline in the number of deaths occurring from it but there has been a most gratifying increase of knowledge and intelligence as to its nature among the

poorest class of the population. The inspectors detailed for this work report that on their first inspection, in nearly one-half of the cases occurring in many parts of the tenement-house districts of the city, it is found that more or less efficient precautions are being taken for its prevention. Such precautions are the use of rags to receive the sputum, which are later burned, instead of handkerchiefs, the use of cups containing water or a disinfecting solution, the separation of the clothing of the patient from that belonging to others, and similar measures.

"This increase of intelligence, and the precautions resulting from it, afford the greatest promise for the future of a persistent and still more rapid decline in the frightful morbidity and mortality caused by the tuberculous diseases.

"Investigations made by the Department, showing that the dust in the street cars and various public places is often infectious, led to the enactment of an amendment to the Sanitary Code, prohibiting spitting on the floors of street cars, ferry boats, and other public conveyances, and requiring that all companies should post in their cars, boats, etc., printed notices forbidding this. This regulation is very difficult of enforcement; but while the results have been by no means entirely satisfactory, there has yet been a definite improvement in the existing conditions."—*Brit. Med. Journ.*, Sept. 11, 1897.

Of the five great methods available for checking the disease, viz.:—

1. General sanitation of towns, including drainage of subsoil and abundant air space and ventilation;
2. Supervision of trades tending to development of tubercle;
3. Proper isolation of the sick;
4. Disinfection of rooms and destruction of sputa;
5. Control of tuberculous food supply, milk and meat;

the first two only have received anything approaching adequate attention in Great Britain.

The isolation of tuberculous patients (except under conditions where they can be most carefully supervised at home) is an urgent necessity. There is not a shadow of a doubt that many hundreds of people develop tuberculosis of lungs yearly who need not have done so if proper precautions had been taken. It is impossible in poor homes for such means to be available. The only solution is the tackling of the question on a large scale, and the foundation of sanatoria for the treatment of both early and late stages of the disease away from the towns. No greater service could be done to the community at present than that this fact should be vividly brought home to the general public by medical

men. The very problematical discomfort to the patient would be far outweighed by the greater chance of cure in well-organised special hospitals, and it is unpardonable to allow friends and relations to be exposed to risks which they do not and cannot thoroughly understand. The incubation and development of tubercle are so slow that the danger does not strike the layman with so much force as in the case of scarlet fever or measles.

In Glasgow, the wise Health Committee has arranged that every single ratepayer shall receive the following leaflet describing fully the nature of tuberculosis and the precautions to be taken :—

"HINTS ABOUT THE PREVENTION OF CONSUMPTION.

The Committee on Health of Glasgow hope that all citizens will read this Paper carefully, and observe the instructions which it contains, and any others given by the Medical Attendant having the same end in view.

Consumption is an acquired, not a hereditary, disease.

What a child may inherit is not the seed but the 'good ground' in which the seed will grow readily.

This is known as a 'hereditary predisposition to consumption.' Special care ought to be taken to protect persons possessing it from any chance of catching the disease.

Colds, sore throats, infectious diseases (especially measles, whooping cough, scarlet and enteric fevers), intemperance, overcrowding, darkness, dampness, stale air—in short, whatever lowers health produces a predisposition to consumption altogether apart from pedigree.

Consumption of the lungs is only one of many forms of disease caused by a minute living creature (germ or microbe)—the bacillus of tubercle. Every case of consumption has received this bacillus, either from man or beast (milk, flesh), and may pass it on to man or beast.

Good health, local and general, is like a coat of mail against the attacks of the bacillus of tubercle.

Every person suffering from consumption suffers from a disease which may be communicated to other persons. This takes place through the spit, which contains bacilli.

So long as the spit is moist it can do no harm unless under such circumstances as are dealt with in Rules 6 and 7.

The spit is gravely dangerous only when allowed to dry, become dust, and so infect the air we breathe.

The surest way to form infectious dust is to spit in a handkerchief and put it in the pocket or beneath the pillow, or to spit upon the floor.

The same result follows if spit is smeared over bed-clothes, night-dresses, etc., or, in the case of men, over moustache or beard.

Practically, then, a case of consumption may be made perfectly harmless by preventing the spit from becoming dust.

1. *Indoors.*—The greatest care is necessary. Dust in closed places is the dust which infects. Use a spittoon containing a little water (not sand or sawdust), or spit into a rag or piece of paper, to be burned at once or thrown into the W.C.

2. *Out of doors.*—Dust is not so readily formed in our damp climate, and it is disinfected by sunshine and fresh air. It is therefore better to spit on the ground than into a handkerchief or into anything which is to be put into one's pocket, except a special spit-bottle, such as may be had for a small sum. Failing this, spit over a street gulley or into the gutter, never on the pavement, and never in a tramcar, 'bus, cab, or railway carriage. Never swallow the spit; it may infect the bowels.

3. If a handkerchief or other article is soiled with tuberculous spit, keep it wet until it can be boiled and washed.

4. Empty the contents of the spittoon down the W.C., and clean the spittoon with boiling water. A little carbolic acid will keep the flies away: these carry off infective matter.

5. In cleaning rooms occupied by consumptives, capture the dust with damp dusters and tea leaves or damp sawdust used in sweeping. Do not chase it about or stir it up. Boil the dusters; burn the sawdust and tea leaves.

6. No spoon, cup, or other article which has been applied to the mouth of a consumptive ought to be used by a healthy person until it has been carefully washed. The remains of food left by a consumptive ought not to be used by the healthy.

7. No consumptive ought to kiss or be kissed, except on the cheek or brow.

8. No consumptive mother should give suck.

9. Consumptive persons ought to have a bed to themselves.

10. Sunlight and fresh air are never-failing disinfectants. Use them freely.

N.B.—Consumption is not communicable by the breath or perspiration. If these precautions are attended to, there is no danger to the healthy in the ordinary intercourse of the family or society.

DISINFECTION.

It is necessary that washing and disinfection should be effectively carried out after every death from consumption.

The services of the Sanitary Department are at the disposal of the ratepayers for this purpose. Immediate notice of such an event ought to be sent to the Medical Officers of Health.

During the currency of cases of tuberculous disease in which there is a discharge, the Medical Officers will give any assistance in the way of washing and disinfection which may seem expedient in the public interest. J. B. R."

Sanitary Chambers,
Montrose Street, Glasgow,
October, 1896.

The admirable example of Glasgow might well be widely followed by other towns.

The disinfection of rooms occupied by tuberculous patients must also become, as it has done in New York, part of the ordinary routine of sanitation. Now that it has been conclusively proved that masses of cases of tuberculosis in special hospitals offer no real risks to their surroundings, while with any carelessness the disease may spread through dust, etc., the least the laymen can ask of us is to see that the best possible means of disinfecting rooms be taken, with as little delay as can be. Those who are familiar with the lives of the tuberculous poor know how bad the conditions really are. There is no sufficient reason why this work should not at once be taken up by sanitary authorities, so far as the public will allow.

For the prevention of *food tuberculosis*, many influences are at work. The Royal Commission on Tuberculosis has been at great pains during the year to amass all available information on the subject, and has visited many places abroad to this end. Their report will be awaited with much eagerness.

Both in Liverpool and in Manchester great attention has been paid to the question. **Niven** summed up his conclusions as follows (*Brit. Med. Journ.*, ii., 1896, p. 331) :—

"Preventive action should take something like the following shape :—

"1. Information as to the precautions needing to be taken should be distributed to every home from time to time, until a sufficient body of opinion is created on the subject.

"2. Tuberculosis attended with discharge should be made a notifiable disease. This would entail additions to the sanitary staff, including probably a qualified medical assistant. The objects of notification would be : (1) To gather precise clinical

knowledge as to the various conditions under which individuals contract tuberculosis. During such an inquiry in Oldham in 1889 I found that about half the deaths from tuberculosis investigated were of people who had previously been in intimate and prolonged intercourse with previous cases. (2) To ascertain and remove insanitary conditions about the house as speedily as possible, so as to give a chance to the patient of recovery, and so as to diminish the risk to the other members of the household. (3) To distribute printed information on the preventive measures required, and to bring about an understanding with medical practitioners as to their giving systematic personal instruction to the patient and attendant. (4) To bring about the disinfection of rooms and clothing when needed.

"3. Hospitals for consumptives are at present foci, whence a practical knowledge of preventive measures radiates.

"It may be doubted whether the time is ripe for the establishment of such hospitals at the public expense. If this becomes possible, such hospitals will greatly aid in reducing the amount of infective material in circulation.

"4. To prevent the milk from tuberculous cows remaining the source of danger which it now is, we require a systematic examination of cows in all cowsheds by competent veterinary inspectors. Two assistant veterinary surgeons have recently been appointed in Manchester for this purpose, and already five cows have been slaughtered as tuberculous, and found to be so. This appointment is one which I have had much at heart. The milk of suspected cows will also be examined bacteriologically where the grounds for condemnation are otherwise not perfectly clear. The veterinary surgeon is now authorised by the corporation to examine suspicious cows with tuberculin.

"Under new regulations an effort will be made to bring the cowsheds into a tolerably sanitary condition—at least those which can be so amended. If the cowsheds are cleansed with water twice a day, and the cows kept clean, and if, in addition, the cowsheds are kept well lighted and well ventilated, then there will not be much risk of infection between cows and human beings, or from cow to cow.

"5. All meat and pork should be thoroughly examined; hence no meat should be taken direct from a private slaughterhouse for sale. The presence of tuberculous glands in meat or pork should suffice to condemn it. In the case of animals killed at the public abattoir, this criterion is not required. It is the more necessary that it should be rigorously applied in other cases.

"6. Cats certainly, and fowls possibly, are a serious source of danger. More attention should be given to the diseases of which cats have died—and, indeed, the causes of death of all our domestic animals should be more fully investigated."

The results of systematic investigation of milk supply at Liverpool are given in a report of the Medical Officer of Health to the Health Committee.

"After describing the conditions which are recognised as the causes of tuberculosis, it is pointed out that the effect of improved sanitation in Liverpool has been to produce a notable decrease in the death-rate from this cause. Thus the annual average death-rate per 100,000 of the population from all forms of tuberculosis in the decade 1866-75 was 430·8, while in the year 1896 it was only 292·5. Investigations into the condition of the milk supplied to the city were made by Professors Boyce, Delépine, Hamilton, and Woodhead. A total of 168 samples were taken from different sources, so as fairly to represent the city supply. The examinations were made both by means of the microscope and by the method of inoculation, but for obvious reasons the results arrived at by the latter method were much more valuable. The conclusions drawn as to the infective properties of the milk are on the whole fairly satisfactory, though indicating the need for further vigilance on the part of the authorities. Contrary to what might have been anticipated, the samples of milk derived from sources within the city were much freer from the germs of tuberculosis than those obtained from the country supply. Thus, out of 122 samples of city milk only 2·8 per cent. gave evidence of infection; while of 24 specimens obtained at the railway stations 29·1 per cent. were capable of producing the disease. The comparative freedom of the milk obtained from town cows is no doubt due to the excellent supervision exercised by the health authorities over the dairies and shippons within their jurisdiction. The report points out that the risk of infection from drinking the milk of tuberculous cows can be entirely avoided by boiling it for a few seconds, and that the common prejudice against this proceeding is entirely groundless. Dr. Hope concludes his report by stating that there is need for additional powers to prevent the erection of town shippons without adequate yard space, and without adequate open spaces around them; also, that more direct powers are required to enable the compulsory removal of diseased animals from shippons, and that measures are called for to prevent the importation into cities of the diseased products of insanitary country shippons."—(*Brit. Med. Journ.*, Jan. 12, 1897.)

II.—THE DIAGNOSTIC VALUE OF THE OLD TUBERCULIN.

Evidence accumulates steadily of the use of Koch's older preparation in the diagnosis of tuberculosis in cattle. The great danger in its use in human beings was that in so many cases it appeared, beyond all doubt, that a tuberculous lesion, quiescent before injection, became active and spread after. This objection, which practically stops its employment for diagnosis in man, is not of importance in cattle, where the object is to discover the tuberculous animals, and then immediately destroy them. Mr. James Wilson, the Fordyce Lecturer in Agriculture at the University of Aberdeen, has published a very interesting little pamphlet on the "Results of the Use of Tuberculin." By separating off all animals that reacted to the injection of tuberculin, a steady diminution of reacting animals from year to year has been observed. Similar results have been obtained by Professor Bang, of Copenhagen, and others.

Kasparek (*Wien. klin Woch.*, 1897, No. 26, *Brit. Med. Journ. Epit.*, Aug. 14, 1897) records the results of an important series of investigations into the action of tuberculin on healthy and tuberculous animals. His first object was to determine in some measure the relation between the reactions produced by different varieties of tuberculin. Preparations were made from human and avian tuberculosis by concentrating six- to eight-weeks-old cultures to one-eighth or one-tenth their bulk. It was found that eight times the quantity of bird tuberculin was required to produce the same effect in the experimental animals (guinea-pigs) as a given dose of the human product; a good deal depended on the body weight of the animal, and guinea-pigs of as nearly as possible the same weight were selected in consequence. These precautions having been taken, the author was able to demonstrate that the tuberculin reaction was constant in diseased as distinguished from non-tuberculous animals. He next investigated the length of time which elapsed after infection with tubercle bacilli before the reaction was obtainable. When infection was accomplished by the injection of bacilli into the abdominal muscles the reaction appeared in thirty-six to forty-eight hours, at a time when no macroscopic lesion could be detected, though the bacilli were multiplying at the seat of injection. The fact that no reaction takes place at first shows that it is an actual tissue change in the animal and not the mere presence of bacilli which renders it so susceptible to the influence of tuberculin. This is confirmed by the fact that the substitution of an equal amount of living tubercle bacilli for the tuberculin gives no reaction whatsoever. When the tuberculous infection

was effected by means of inhalation no reaction was obtained till after six daily exposures of an hour each; whenever it was obtained the animal eventually succumbed to tuberculosis. This shows the extraordinary diagnostic value of tuberculin. The last series of experiments consisted in the injection of tuberculin into animals which had been weakened previously by diphtheria toxin. Fever resulted in these cases, but was not of the same type as that constituting the tubercle reaction, than which it lasted at least five or six hours longer. Kasparek's conclusions are as follows: (1) The tuberculin reaction occurs very early (thirty-six to thirty-eight hours) in animals infected with tubercle—as soon, in fact, as the slightest amount of tissue change has taken place; (2) the activity of a tuberculin preparation varies with the source from which it is obtained; (3) the fever evoked by tuberculin in animals weakened, for example, by diphtheria toxin is distinguishable from the typical reaction by its greater duration.

Loesch (*Archives des Sci. Biolog. de l'Institut Impér. de Méd. Expériment. à St. Pétersbourg*, Tome iv., No. 5, 1896; *Brit. Med. Journ. Epit.*, Sept. 4, 1897), as a result of numerous experiments on healthy and tuberculous animals, finds that after injection of tuberculin for diagnostic purposes what he terms the blood reaction is a much more constant and reliable sign of tuberculosis than the usually accepted elevation of temperature. This blood reaction consists in a diminution of the number of white corpuscles in the blood of tuberculous animals, which is most marked two to four hours after the injection of tuberculin. The reaction is never met with in healthy animals. Another difference is that leucocytosis is at its maximum the day after the injection in healthy animals, but on the second day in tuberculous ones. From other experiments, which were, however, too few for positive conclusions to be drawn, he believes that mallein in glanders has the same effect on the white corpuscles as tuberculin in tuberculosis.

III.—THE NEW TUBERCULIN.

Undoubtedly the most interesting announcement of the year was Koch's account in the *Deutsch. med. Woch.*, of April 1st, of the steps that had led to the production of his new tuberculin.

In "Treatment," p. 187, **Edward Squire** gives an admirable summary of the article.

"In publishing his further researches with tubercular cultures and the elaboration of a preparation which possesses the anti-tubercular properties of tuberculin, without its unsatisfactory effects, Koch ('Ueber neue Tuberkulin-präparate,' *Deutsch. med.*

Wochnschr., No. 14, 1897) points out that in complete immunity there are two factors—immunity as regards the bacteria, and immunity as regards the toxin. Behring and Kitasato have shown that animals can be immunised against tetanus. After a time, however, the immunity passes off, and the animals may then suffer from tetanus without any new infection of bacilli. The immunity here is against the *effects* of the bacilli—the toxin; the bacilli themselves may remain active, and when the protection against their products passes off they are able to produce the disease. The other immunity—that against the bacteria—is seen in cholera and typhoid. In these diseases Pfeiffer has shown that immunised animals are protected against the living bacteria but not against the products of these, since injection of the toxin is followed by the disease.

"'The ideal of immunisation will always be to protect the animal or the human body not only against one of the dangers which the pathogenic micro-organisms bring in their train but against all.'

"It seems as though no immunity is possible against tuberculosis, since in man it may exist for years without appreciable loss of virulence. Even when cure is effected the individual is not protected against a new invasion of the tubercle bacillus. Koch, however, in spite of this fact, sees indications which suggest that, under certain circumstances, a kind of immunisation is evidenced. This he finds in the fact which may be observed in miliary tuberculosis in man, and in the experimental tuberculosis of guinea-pigs, that there is, as a rule, a stage during which the bacilli, which were at first in large numbers, again disappear. It can be seen that the tubercle bacilli are extremely slowly absorbed, and the immunity appears to be purely bacterial.

"All Koch's attempts to produce rapid resorption of the tubercle bacilli from the tissues were unfortunate. Dead tubercle bacilli injected into the blood-stream produce in the lungs exactly the same tubercular nodules as the living bacilli; and in these nodules one can find, a long time afterwards, the unaltered tubercle bacilli.

"Chemical investigation showed that the tubercle bacillus contains two fatty acids of different solubility in alcohol. It is one of these which fixes the colour of fuchsin, and so gives to the bacillus its characteristic staining reaction. It is apparently this substance also which renders resorption of the bacillus so difficult.

"The problem then resolved itself into the endeavour to free the bacilli from this substance.

"The attempt was therefore made to render the bacilli capable of resorption by chemical means.

"A preparation was made by extracting tubercle bacilli with deci-normal soda solution. The fluid was filtered and neutralised, forming a clear pale yellow liquid, which was not free from (dead) tubercle bacilli. This liquid was designated T.A. (alkaline tuberculin).

"This T.A. produced in animals, even in very small doses, a similar reaction to that of tuberculin; the reaction lasted longer, and the tendency of the animal to react to the fluid also remained longer than in the case of tuberculin. One great disadvantage of this preparation was that it invariably produced abscesses at the seat of injection.

"Resort was next made to mechanical means. Taking a well-dried culture, this was well pounded with agate pestle and mortar for a long time, till few bacilli remained. The material was then diluted with distilled water and centrifugalised. A clear, whitish, opalescent and transparent fluid was thus separated from a solid residue. The residue was dried, again pounded in the mortar, and again centrifugalised, giving again a clear liquid and a solid residue. The process can be again repeated until practically no solid matter remains. Injections with the fluid obtained in this manner never produced abscesses so long as the preparation had been well centrifugalised, and no bacilli remained. The fluid by the first centrifugalisation differed somewhat from the rest, and was designated T.O.; the results of the further centrifugalisations, which could not be distinguished from each other, were called T.R.

"Tested on animals, the T.O. produced almost identical results with the alkaline extract (T.A.), except that no abscesses were produced. It has, however, very small immunising effect. The T.R., on the contrary, produces decided immunisation. It also may produce 'reaction' if given in too large doses, but its effect is not at all dependent on this reaction; whereas with the original tuberculin, as well as with the T.A. or the T.O., 'reaction' must be obtained in order to get the curative effects. When an individual is immunised against the T.R., even when during the immunisation reactions are almost entirely avoided, he no longer reacts to even large doses of tuberculin or of the T.O. This Koch has confirmed in so large a number of cases that there can be no doubt of the fact.

"The preparation by hand of this immunising material is not free from danger of infection; it can, however, be perfectly well prepared by machinery, and is manufactured according to Koch's directions by the firm of Meister, Lucius and Brüning, of Höchst on Main.

"The use and dosage of the preparation is simple. The injections are made with a sterilised syringe in the back. The fluid contains 10 mgr. solid in a cubic centimetre, and is to be diluted for use with physiological salt solution (not with carbolic solution) to bring it to the required dose. One commences with $\frac{1}{500}$ mgr. If a reaction occur the dose must be further diminished. Injections are made every other day with slightly increasing doses, so that there is never a rise of temperature over $\frac{1}{2}$° C. (nearly 1° F.). Any rise of temperature must be allowed entirely to subside before a fresh injection is made. Koch has, as a rule, gone up to a dose of 20 mgr., and if no reaction follows this dose, he stops the injections, or only resumes them after a long interval. In lupus cases Koch has found improvement in excess of that obtained by tuberculin, and satisfactory results have also followed the employment of the remedy in tuberculosis of the lung."

The method of dilution has recently been slightly modified. *The directions are now as follows :—*

"It must be kept in a cool, dark, and dry place. The solution contains 10 mgr. solid substance in each cubic centimetre.

"The treatment is generally commenced with $\frac{1}{500}$ mgr. of solid substance. If a reaction appears, the dose must be still further reduced.

"For dilution of the liquid, a 20 per cent. glycerine solution should be employed. The dilutions are preferably made in the following manner :—

"1. With a 1 c.cm. pipette calibrated to $\frac{1}{10}$, 0·3 c.cm. is withdrawn from the bottle and mixed with 2·7 c.cm. 20 per cent. glycerine solution, making in all 3 c.cm. This 10 per cent. solution contains 3 mgr. solid substance.

"From this 10 per cent. dilution 0·1 c.cm. is taken and made up to 10 c.cm. with glycerine solution. Thus a 1 per mille dilution of the original fluid is obtained. Two divisions, or $\frac{2}{10}$ c.cm. of a Koch or Pravaz syringe of this dilution therefore contains $\frac{1}{500}$ mgr. of solid substance.

"Instruments and pipettes must, before use, be sterilised with absolute alcohol and ether, and then rinsed out with sterilised glycerine solution, in order to remove every trace of alcohol and ether.

"N.B.—The 20 per cent. glycerine solution is prepared by boiling 20 c.cm. pure glycerine with 80 c.cm. distilled water for fifteen minutes, and then cooling thoroughly before use.

"Dilutions which present a turbid appearance, or show a deposit which does not dissolve upon shaking, must not be

employed. Generally, the dilutions keep well for a fortnight in cool and dark places.

"The injections are made subcutaneously every second day, the dose being raised so gradually that a rise in temperature of more than half a degree is as far as possible avoided. Any febrile symptoms caused by the injection must have entirely disappeared before a fresh injection is made. With doses of 5 mgr. solid substance and upwards it is not advisable to make more than two injections within the week, and with still larger doses not more than one. The individuality of the patient has generally to be taken into account.

"As a rule, the dose is increased to 20 mgr. solid substance, and if no reaction follows the injection of this dose, the treatment is discontinued, or only repeated at long intervals.

"For injection, such parts of the body should be selected where large folds of skin may be raised. The local reaction that not infrequently appears in the locality of the injection generally disappears within twenty-four hours, and must be taken into account in increasing the dose."

The few months that have intervened make it impossible to draw any definite conclusions as to the value of the remedy. It is being used by many investigators in many places.

Most of the early criticisms of the new remedy that have appeared so far are not convincing. In the *Anales Medicos Gaditanos*, July 15, 1897 (*Brit. Med. Journ. Epit.*, Aug. 21, 1897), **Prof. Juan L. Hohr**, of Cadiz, reports on four cases of varied forms of tuberculosis, treated with the new tuberculin.

"(1) Boy, aged seven years, suffering from Pott's disease and tuberculous osteitis of the femur. There was a fistula with scanty discharge, with pain in the limb so severe as to prevent sleep, and great weakness. On April 21st 1 c.cm. of the $\frac{1}{500}$ solution, and on the 23rd 2 c.cm. were injected. The immediate result was increase of suppuration and cessation of the pain. Further injections were followed by rise of temperature, sleeplessness, and loss of appetite, and they were discontinued for two or three weeks. The treatment was then resumed, but the febrile symptoms produced were so marked, and showed such persistence, that it was again abandoned. The sole benefit observed in this case was the total cessation of pain. (2) A man, aged twenty-three, with pulmonary tuberculosis at both apices. Injections of the $\frac{1}{500}$ solution caused increase of cough and diminution of appetite; the febrile reaction caused by the tuberculin continued for some days after the injection. (3) A man, aged thirty-one, with tuberculous adenitis of the cervical glands and ulcers on the

neck and shoulders; no chest symptoms. Injections of 1 and 2 c.cm. of the $\frac{1}{100}$ solution were followed by the development of sharp catarrh, with abundant discharge and cough. The effect of the tuberculin on the diseased parts in the neck was to set up inflammation in the scars of old ulcers, which quickly broke down, exposing caseous material, which was eliminated in a few days. But new points of ulceration appeared in the neck, and at the same time chest symptoms developed to such an extent that it appeared that the disease had been kindled in several foci. On the injections being discontinued, the patient regained his strength, and the ulcers healed under surgical treatment. (4) A woman, aged thirty-six, suffering from superficial lupus of the nose and upper lip, which were the seat of scars; the disease was of eight years' standing. There was a fresh patch on the chin, and another along the jaw. Injections (1 and 2 c.cm.) of the $\frac{1}{100}$ solution caused disappearance of the redness around the patches, but the patient complained of great weakness and pain in the limbs, and of feeling 'ill all over.' The treatment was therefore discontinued. The author's experience leads him to conclude that the new tuberculin, even in the highest degree of dilution, always causes reaction, though the intensity may vary. Koch's statements cannot, he thinks, be reconciled with clinical facts, and he considers the new tuberculin 'impossible' as a therapeutic agent."

Bussenius (*Deut. med. Woch.*, July 8, 1897; *Brit. Med. Journ. Epit.*, July 31, 1897), has used the T.R. tuberculin in nineteen cases, comprising four cases of lupus, twelve of laryngeal tuberculosis, two of uncomplicated pulmonary phthisis, and one of asthma. In fifteen of the nineteen cases the treatment was completed, with a total of three hundred and fourteen injections; in the four remaining cases twenty injections were given. The largest number of injections given in a single case was twenty-five; the greatest total amount used was 15·276 c.cm., and the largest single injection of the fluid 4 c.cm. The longest duration of treatment was sixty-five, and the shortest twenty-nine days. A short time after the completion of the cure, the reaction was tested with the old tuberculin, but in all the nineteen cases with a negative result. Any reaction after T.R. is to be avoided; the body temperature should not rise above $\frac{1}{2}$° C. The object in view is, by a gradual increase of the dose, without any considerable local or any general reaction, to make the patient rapidly immune against the larger doses. This was only completely effected in four cases. The age of the injection fluid is of great importance in connection with the rise of temperature. Curves

obtained showed that any increase in the pulse and breathing depended almost always on the rise of temperature, and that other symptoms also stood in direct relation to it. As regards weight, seven patients increased in body weight, but five lost in weight up to ten pounds, the remaining ones keeping stationary. The author says that it may be open to question whether it is desirable to continue the system of doubling the dose when the larger quantities are being given. There was never any blood or albumin in the urine. No abscess occurred. The fluid was proved bacteriologically to contain no pyogenic microbes. The syringe was boiled for ten to fifteen minutes before use. In ten of the nineteen cases there was a slight infiltration at the site of the injection. No decrease in the area of dulness was made out in the cases of pulmonary phthisis, whether uncomplicated or not. In tuberculosis of the larynx, etc., no considerable redness or swelling was observed in the infiltrated parts. Occasionally a tendency to cicatrisation of ulcers was seen. The author is unable to say, however, that the new tuberculin gave better results than other treatment applied to the laryngeal disease. He gives details of three lupus cases, in which the treatment was completed. The results were such as to encourage a further trial of the treatment.

Schultze (*Deut. med. Woch.*, July 8, 1897) says that the time is as yet too short to give any conclusions as to the value of T.R. He has used it in nine cases. There was no deterioration in the condition of the patient, such as was noted even after small doses of the old tuberculin. In one case an apparently tuberculous laryngitis appeared during the treatment, and the general condition of the patient's nutrition made it necessary to discontinue the treatment. Intestinal disturbance occurred in another case, so that the treatment could not be continued. In four other cases no noteworthy change was observed. In yet another case a dry pleurisy improved, as well as the patient's general condition. In the remaining two cases, treated as out-patients, there was an improvement, and in one of them a laryngeal perichondritis cleared up.

In *La Presse Médicale*, June 5, 1897, **L. de Nencki**, **L. de Maczewski**, and **A. de Logucki** sharply criticise the new drug. They base their attack on three points :—

1. The whole method of preparation is extremely dangerous to the workers. Koch himself had called attention to this.

2. The tuberculin sent out is not always absolutely sterile. A glass or rubber cork instead of the ordinary cork would be far better. (This has been done.)

3. The dilutions that have to be made, and the small quantities employed, make its use very difficult for the busy practitioner. There is much force in this objection. Unless the whole of the instruments and materials used are strictly sterilised, it is easy in the process of dilution thoroughly to contaminate the preparation, and so get unfavourable results. In the earlier bottles sent out (April 2 and April 6), they found, on making cultures, that there were pneumococci and streptococci and staphylococci present in the tuberculin.

A careful microscopic examination of the tuberculin, and preferably a bacteriological examination also, should be made of each bottle before use. This has been found necessary in the case of serums also.

Koch points out, and it is needful to be perfectly clear as to this, that only early cases and pure tuberculous cases can be influenced for good by the treatment. Many of the cases used for criticism do not properly belong to this class.

In the *Münch. med. Woch.*, July 20, 1897, **Schröder**, of Hohenhonnef, who has tried the remedy in three cases, is severe and brief. All three patients became worse, and he confirms Nencki's observation that the fluid is not invariably sterile. The results are of some importance, as the patients seem to have been precisely at the stage when some benefit might have been expected.

IV.—SEROTHERAPY.

Full accounts of the Maragliano serum were given in the "Year-Books" for 1896 and 1897. Investigations as to its value continue to be made, though the reports are not so numerous this year as last.

Raimondi and **Mascucci** (*Rif. Med.*, May 5, 1897) report the effect of this serum in five men and ten women. Five are described as phthisis with lesion circumscribed in one or both lungs, slowly progressing disease with little or no fever; ten had more or less extensive tuberculous broncho-pneumonia, with cavities, fever, and night sweats. In the latter group 5 to 10 c.cm. of serum were given every five to eight days until some effect was produced (for example, lowered temperature), and then 1 c.cm. every day or alternate days. In the former group 1 c.cm. was given on alternate days. A generous diet was ordered, and phosphates of iron or calcium were administered. The total quantity of serum given varied from 20 to 100 c.cm. No deleterious results of any importance followed the injections. As to the effect on the disease, no

absolute cure was effected. Apparent cure or noteworthy and persistent improvement was observed in four cases, transitory benefit in six cases, no useful result in three cases. The good effects observed were diminution or cessation of the fever and night sweats, rapid improvement in strength, nutrition and body weight, and disappearance or lessening of the physical signs.—(*Brit. Med. Journ. Epit.*, June 5, 1897.)

Hager, in a preliminary communication (*Münch. med. Woch.*, August 3, 1897) relates his clinical experience of this serum in the treatment of tuberculosis. A great advantage of the serum treatment over tuberculin is that it does no harm even in advanced cases of tuberculosis. The reports on the value of this serum have been generally favourable. The author would confirm the statement of Maragliano that the serum may have a favourable action on all the specific symptoms of tuberculosis. The serum does not appear to exercise any effect on the tubercle bacillus itself, but neutralises the products of this micro-organism. Among cases of advanced phthisis treated within a year, and mostly confined to bed, only one had succumbed to the disease. The author then discusses the action of the serum on the lupus lesion. It can be painted on the patch, and yet produce its beneficial results. It produces a swelling of the lupus tissues, and in a few days retrogressive changes are present. The neighbouring lymphatic glands become swollen. Three or four paintings usually suffice if the lesion is not too extensive. The cicatricial changes develop themselves speedily under this treatment. A simultaneous injection of the serum hastens the recovery. It is quite possible that Maragliano's method of obtaining the serum may be improved upon, and thus a more efficient serum be produced. The author concludes by stating that those trying the preparation as obtained from Merck will not fail to find that this treatment constitutes an advance.—(*Brit. Med. Journ. Epit.*, Sept. 9, 1897.)

V.—SPECIAL DRUGS AND METHODS.

1. Guaiacolate of piperidine.

Arnold Chaplin and **F. W. Tunnicliffe**, in the *Brit. Med. Journ.*, Jan. 16, 1897, give an account of fourteen cases in which this drug was used.

The pharmacology of the guaiacolate of piperidine resolves itself into the pharmacology of guaiacol and piperidine, for it is into these substances that the salt is decomposed, probably not in the acid medium of the stomach but in the alkaline one of the duodenum. The reason for this assumption is that large doses—ʒj—can be given without the slightest eructation of guaiacol.

The action of guaiacol is too well known to be discussed here. It acts in the intestine as an antiseptic; in the structures through which it is excreted—for example, the respiratory mucous membrane—it acts also as an antiseptic. The authors only give a brief summary of the pharmacology of piperidine, as this subject forms part of a research to be published elsewhere by Tunnicliffe in conjunction with Dr. Lauder Brunton. When hydrochlorate of piperidine, suitably diluted, is injected into the circulation in doses of 0·05 gr. pro kilo body weight, the heart is slowed and the vessels are contracted, a considerable rise of blood pressure taking place. When injected under the skin in doses of from 1 to 2 cgr. pro kilo, an increase in reflex excitability occurs, so that if the drug is pushed convulsions may develop. Thus in suitable doses piperidine must be regarded as a cardio-vascular tonic and spinal stimulant.

During the last three months an inquiry as to the value of piperidine guaiacolate in the treatment of pulmonary tuberculosis has been carried out at the City of London Hospital for Diseases of the Chest. The patients to whom the drug was given were subjected to close observation, and the effects of the medicine were from time to time noted. In all, fourteen cases were placed under observation, of which eight were out-patients and six in-patients. The duration of the observations varied, but as a general statement it may be said that six weeks was the average. In order to test efficiently the value of the drug, cases were chosen more or less haphazard, some being early cases in which improvement might be expected under appropriate treatment, others being more advanced, while yet others were in such a stage as to make it improbable that much good would accrue from any form of treatment. In all cases the dose to begin with was fixed at 5 gr. three times a day, and this was gradually increased until 20, and in one case 25 gr., were given for a dose. So far as could be gathered from questioning patients and personal observation, no unpleasant effects were noticed. All of them stated that the medicine had agreed with them. Pains were taken to ascertain if the drugs produced any gastric or intestinal irritation, but in no case could it be determined that the processes of digestion were in any way interfered with by the medicine. We think this worthy of special stress, because experience has so often taught us that when other derivatives of creasote, such as crude guaiacol, are given over a lengthened period, their use has to be discontinued from time to time, owing to the gastric and intestinal disturbances caused by them. But in these cases no such untoward event happened.

With regard to the varied symptoms of phthisis, it is difficult to say with certainty that the guaiacolate of piperidine had any distinct effect upon them. For in all cases of phthisis it is so frequently found that improved hygienic conditions (good food, rest, and attention), such as residence in a hospital affords, play a large part in the restoration of the patient's health. This much may, however, be said, that in many instances the cough appreciably improved while the treatment was in progress. The temperature was in no case affected adversely by the drug; in most cases it receded to normal. The appetite, for the most part, was maintained, and very often patients expressed the belief that the medicine improved it; indeed, in some cases it seemed that it had a markedly good effect upon the appetite. Some patients gained in weight while the treatment was going on, and in two instances it was thought that more flesh was put on than would have been the case had ordinary remedies been tried. The expectoration in most cases decreased while the drug was being taken. Among the out-patients especially there was a general improvement in strength and vitality. In the case of out-patients it must be remembered that improved hygienic conditions do not come into operation to the advantage of the patient as they do in in-patient practice.

Coming now to speak of the changes noted in the physical signs, it must be admitted that discussion of this subject is full of difficulty, for it so often happens that, although considerable improvement takes place in the general condition of the patient, yet no marked change occurs in the physical signs. Some of the cases (out-patients) whose condition was found to be improving were examined week by week to see if any change could be found in the physical signs. Consolidation and excavation were of course unaffected, but in not a few instances the lungs were noticed to become drier, with less moist crepitant *râles*. This change was attributed to the fact that the area of simple inflammation around the tuberculous infiltration itself had passed from an active to a more quiescent condition. It must be admitted, however, that the same improvement in physical signs could not be seen in most of the cases under treatment as in-patients. Two out-patients considered that the medicine relieved their dyspnœa, and, to judge from the lung signs, which were under the treatment improving rapidly, it might very well be the case.

In stating the effects of any new drug upon a given disease, the physician must always guard himself against "over-enthusiasm"; so often it happens that a new medicine has been reputed to be successful in some affection, and upon fuller trial its effects

are found to be trifling, or even *nil*. Of piperidine guaiacolate it may be generally stated :—

1. That experience has shown that it is a perfectly safe drug in doses of from 5 to 30 gr. three times a day.

2. That it causes no unpleasant effects.

3. That it is exceedingly well borne by the stomach, and in this respect it is equal to any other derivative of creasote.

4. That patients while under its influence improved in appetite and general strength.

2. Oxytoxins.

Hirschfelder, of San Francisco (*Brit. Med. Journ. Epit.*, April 17, 1897) has published a "provisional report" of a new treatment of tuberculosis and other infectious diseases. Having regard to the well-known objections to the administration of antitoxins in solution in the serum of animals, he has sought a method of preparing them directly from the toxins in the culture fluids, without the intervention of the animal body. He believes that the spontaneous cure of tuberculous peritonitis after simple laparotomy is due to the oxidation of the tuberculin in the peritoneal cavity. He therefore concludes that the oxidation of toxins produces antitoxins, and has investigated the action of the oxytuberculin manufactured by lengthened treatment of tuberculin with peroxide of hydrogen. At the same time, as tuberculosis is usually a mixed infection, he prepared an oxysepsin in a similar manner from the sputa of cases showing high fever. The quantities of these oxytoxins which could be injected without causing a local disturbance were enormous, reaching 60 c.cm.; the ordinary daily dose was, however, 5 c.cm. of oxytuberculin and 10 c.cm. of oxysepsin. The author adduces eight cases in support of his treatment, for which he claims the following remarkable properties: Within a few days the cough and expectoration diminish, the appearance of the patient reverts to that of health, and the appetite returns; the temperature rapidly sinks to normal, the infiltration of the lungs disappears, and the tubercle bacilli in the sputum rapidly diminish, and eventually disappear. A year's use of this treatment by the author has been singularly satisfactory, particularly in early cases. He has also obtained promising results with similar oxytoxins in pneumonia, empyema, and streptococcus infection.

This report is amplified by a further contribution in the *New York Medical News*, July 3, 1897 ("Treatment," vol. i., p. 282). Formerly Hirschfelder used Koch's tuberculin for the preparation of oxytuberculin. He now prepares his own by the cultivation of the tubercle bacillus upon veal bouillon containing 4 per cent.

of glycerine, 1 per cent. of peptone, and 0·5 per cent. of chloride of sodium, to every litre of which, when neutralised, 3 c.cm. of a normal solution of carbonate of sodium are added. After the germ has fully grown, so that the tuberculous scum which floats on the surface begins to sink, the flask is sterilised by heat for two hours, and the contents are filtered. A measured quantity of this tuberculin is put into a stone jug, and one-tenth the quantity of a ten-volume solution of peroxide of hydrogen is added, and the jug is stoppered with cotton-wool and put into a steriliser at 100° C. Every twelve hours the same quantity of peroxide of hydrogen is added, until at last the quantity of peroxide solution equals the quantity of tuberculin used. This is then heated to 100° C. for twelve hours longer, and at the end of this time (120 hours in all) it is found still to contain free peroxide of hydrogen, is highly acid, and has become darker. It is made alkaline with caustic soda, and reheated to drive off the excess of peroxide of hydrogen. Five per cent. of boric acid is added to keep it from decomposing. It is then filtered into sterile vessels, and is ready for use. Experiments are detailed which show that this oxytuberculin directly prevents the growth of the bacillus of tuberculosis; that its action is specific upon that germ, and that it is not due to a general antiseptic effect. Though the bacillus of tubercle will grow on a veal bouillon which has been mixed with an equal quantity of the original tuberculin, no growth will take place if oxytuberculin be similarly used instead of tuberculin. Other germs—such as those of typhoid and diphtheria, and the staphylococcus—develop, however, in this latter liquid.

Injected under the skin of patients with the usual antiseptic precautions, no abscesses are formed and there is no reaction, but marked improvement is quickly noted.

It is used in large doses, as much as 40 c.cm. being given.

The author believes that consumption may be cured by the use of oxytuberculin if the remedy is administered during the early stages of the disease, and that the cure is effected by a direct action upon the causative germ.

Reports by others than the inventor of this method are at present very few.

3. Camphoric acid in phthisical sweating.

Camphoric acid is suggested by **Ralph Stockman** and **Prof. Hare** as valuable in the treatment of tuberculosis. **Hector Mackenzie** gives a summary of their paper in the *Practitioner*, April, 1897, p. 408. The dose is 20 gr. in cachets, or dissolved in whisky or brandy, or in dry powder placed on the tongue and washed down with a little water or milk. It is only slowly absorbed, and

should be given an hour or two before the sweats come on. It is not poisonous, even in large doses, and its only unpleasant effect is occasional slight irritation of the stomach. Some renal irritation and a skin eruption have also been caused by it.

4. Eucalyptus oil and oil of cinnamon.

(1) *Eucalyptus oil.*—**Arthur Douglas**, of Fort Peddie, Cape Colony, describes a very thorough method of employing this drug in "Treatment," vol. i., p. 175:—

"In carrying out the antiseptic treatment of phthisis the drug I prefer to employ is the oil obtained from the leaves of the eucalyptus globulus, for the following reasons:—

1. It is three times as powerful an antiseptic as carbolic acid in arresting the development of bacteria.
2. It is volatile at ordinary temperatures.
3. Its vapour ozonises the oxygen of the air.
4. Its smell is not unpleasant.
5. It is readily absorbed into the system either—

a. By the air breathed; or
b. By the stomach; or
c. By the skin.

6. After absorption it exercises no irritant or other deleterious effect on the body.
7. It is excreted in considerable amount by the breath.
8. It is a powerful 'febrifuge.'
9. It reduces the force and frequency of the heart.
10. It increases elimination of urea.
11. It lessens mucous secretion, improving its quality and promoting its expectoration.

"I have frequently administered it in 5- to 30-minim doses for weeks at a time without the manifestation of any symptoms.

"It can be conveyed into the system either (1) by the mouth, or (2) by inhalation, or (3) by inunction.

"Internally it is conveniently included in the following formula:—

℞	Ol. Eucalypti	♏v.
	Sp. Chloroformi	♏x.
	Sp. Ætheris	♏x.
	Mucilage Acacia	ʒj.
	Glycerine	℥ss.
	Aq. ad.	℥j.

T. D. S.

"The dose of the oil is gradually increased to 10 minims thrice daily.

"For 'inhalation' I prefer not to use any steam vaporiser, atomiser, or respirator. The object I have in view is to induce the patient to breathe a '*saturated atmosphere*' without any effort or inconvenience on his part, and without interfering in many cases with his daily avocation.

"To do this effectually we proceed to saturate the atmosphere in the patient's bedroom by vapour volatilised from the eucalyptus oil. It is necessary that a large extent of surface should be exposed. This is effected by saturating a long piece of cotton or linen fabric with the oil and stretching it out in several layers, one above another, over a double series of horizontal rails placed parallel to each other. By this means a large area is exposed without occupying too much space. The size of the cotton should be about ten feet long by one foot broad, divided into eight layers or folds. The dry cloth is dipped into a basin containing about 6 or 8 oz. of the oil, being gently squeezed to prevent dripping, and hung in the manner indicated at a temperature of 65° F. Over four-fifths will be found to have evaporated in six hours.

"The cloth should be placed in the patient's room one hour before he retires to rest, the windows and door being closed.

"On entering the room the patient should be directed systematically to practise full and deep breathing for five or ten minutes in a standing position. An attendant then rubs into the chest 3 or 4 dr. of an ointment of lanoline and eucalyptus oil 3 dr. to the ounce. This should be completely absorbed.

"It is desirable, too, that the patient should go through a gentle exercise for ten minutes with light dumb-bells or Indian clubs to promote expansion of chest and muscles. This exercise must always be suspended short of fatigue; there must be no shortness of breath and no dilatation of alæ nasi. The patient then retires to bed, the windows and door remaining closed. This treatment should be persistently carried out for weeks and months, and should not be in any way relaxed on improvement taking place. Obviously the cases most benefited are those taken at an early stage; but even in advanced cases no little improvement may be looked for, especially in the amount and freedom of the expectoration, diminished waste and fever."

To those who do not quite appreciate the charm of eucalyptus oil the treatment must be somewhat severe.

(2) *Oil of cinnamon.*—**Hilton Thompson**, in the *Brit. Med. Journ.*, Nov. 7, 1896, revives again, with some good cases, the use of oil of cinnamon in tuberculosis. He says: "I take it that a drug to be perfect for inhalation should possess the following qualities: 1. It

should be strongly antiseptic. 2. It should not be injurious to the tissue cells of the lung or the organism. 3. It should possess a pleasant taste and smell or an absence of both. 4. It must not produce nausea or loss of appetite if used for a considerable time. None of the antigermicidal drugs that have been used in the treatment of phthisis appear to possess all these qualities. Although most have their good points, and are no doubt useful in certain cases, none of them appears to be thoroughly satisfactory.

I first used the drug as an inhalation in cases of tuberculous phthisis in 1892. I found the patients liked the smell and taste of the oil; it caused no irritation of the air-passages, and did not interfere with the appetite; the progress of the disease was influenced favourably. My interest was further aroused in 1893 by a paper by Dr. Lucas-Championnière, and since then I have regularly prescribed inhalation of the oleum cinnamomi ver. in cases of consumption.

That oil of cinnamon, when used as an inhalation in certain stages of consumption, affects injuriously tubercle bacilli is, I think, rendered probable by the very remarkable way in which, in the above cases, the organism diminished in numbers or disappeared from the sputum in a comparatively short time after commencing treatment. Also by the tendency for the disease to relapse when inhalation was discontinued. It appears probable that the oil of cinnamon tends to cure consumption in two ways: first, in the very early cases of catarrhal phthisis, by so directly affecting the bacilli as to stop their growth; and secondly, in cases that are rather further advanced, by only allowing organisms incapable of growth to pass along the bronchi, thus preventing the infection of fresh lobules. In this way the disease may be limited to a small area, where it can be dealt with by the vital processes of the body, and cut off from the system by the formation of fibrous tissue, and so cease to be an immediate source of danger. Besides the five cases abstracted, the drug was tried in the more advanced stages of the disease, but, as might be expected, without any benefit.

An interesting feature of the above cases was the order in which the symptoms subsided. The expectoration and the cough were the first to improve, then the temperature tended to the normal, and finally the weight began to increase. These favourable changes in the symptoms were accompanied by a gradual diminution in the number of tubercle bacilli in the sputum.

With regard to the form of inhaler used, I found that those

in ordinary use served the purpose very well. If the patient were in an early stage of the disease, I endeavoured to persuade him to use an inhaler that would cover both the nose and the mouth, but in the later stages, when there was shortness of breath, an inhaler covering the mouth only was used. I found that in the early stages of the disease particularly the patients liked the smell and taste of the cinnamon; they could use it most of the day and also at night with very little discomfort. It was also interesting to note that the continued inhalation of the vapour caused no irritation of the buccal cavity or of the air-passages, and that no constitutional effects were produced.

Of course, my experience with the oil is comparatively limited, but so far as it goes I have found the oil of cinnamon to have more points in its favour, when used as an inhalation in the early stages of consumption, than the drugs that hitherto have been administered in this way and for similar objects."

That oil of cinnamon is an exceedingly pleasant substance to inhale, and in many cases lessens cough is certain. It can do no harm. Whether it is of any real permanent value is doubtful.

5. Eosote.

Grawitz (*Therap. Monatshefte*, July, 1896; *Brit. Med. Journ Epit.*, Oct. 10 1896) has employed this new compound (the valerianic acid ester of creasote) for several months in Gerhardt's clinic. It is a labile fluid distilling at 240° C., and is free from irritant or poisonous properties. It is put up in gelatine capsules, and is taken by patients without the repugnance which they usually exhibit towards creasote compounds. Each capsule contains 3 gr., and the dose commences with one three times a day, increasing to six or nine, so that nearly 30 gr. of creasote can be taken daily in this form. Grawitz's experience of eosote extends to thirty-five cases of tuberculosis and many others of gastro-intestinal affections in which it was used as an intestinal disinfectant. Its employment was nearly always attended with complete success, and only in the rarest cases was it necessary, after many weeks, to suspend or cease the use of the drug on account of digestive disturbances. No toxic indications were observed, and the author strongly recommends the new substance on account of its palatability, its cheapness, and the ease with which large doses are tolerated.

6. Peronin.

Schröder, of the Hohenhonnef Sanatorium (*Therap. Monatshefte*, 1897, No. 4), advocates the employment of this drug in some of the useless irritating coughs of tuberculosis of lungs. It is the hydrochlorate of the benzylic ether of morphine. Compared with

codeia it appears to have the advantage in causing less sickness and constipation. The dose is from $\frac{1}{3}$ to $\frac{3}{4}$ gr., given either in watery solution or in pill form. So far as I have used it at present, it seems of some value.

7. Röntgen rays.

It is abundantly proved that the X rays are of value in demonstrating certain conditions of lungs. The more interesting problem, whether they have any effect on organisms, is still quite unanswerable. The question was raised very early by **Glover Lyon.** Attempts to diminish the virulence of bacteria in the laboratory by exposing them to the rays have ended so far in failure or very doubtful positive results. Here and there we read in clinical records of patients who have been exposed to the X rays for curative purposes in pulmonary tuberculosis, but the complexity of possible influences is so great that the results are not convincing. One such is abstracted in the *Brit. Med. Journ. Epit.*, 1897.

Chapteloube, Descomps, and **Roullies** (*Archives d'Electricité Médicale*, May 5, 1897) describe the effects of treatment by means of Röntgen rays upon a woman aged twenty-two, the subject of acute and rapidly-spreading pulmonary tuberculosis. "There was a cavity at the right apex, the whole right lung was infiltrated, and there was generalised extension to the left lung; the sputum was crammed with tubercle bacilli. Medical treatment had no effect upon the symptoms; hectic supervened, and the patient rapidly lost ground. All medicines were accordingly left off, and the influence of the X rays was substituted. During the first fortnight of their employment, which was much resented by the patient, the general condition became worse. At the eighth application a kind of crisis occurred, with a fall of temperature, which had, however, risen again to 103·2° by the end of the fortnight. At this time there could be noticed some improvement in the right infraclavicular fossa. During the next month the rays were used from behind twice a day; this resulted in a marked drying up (fibrosis) of both lungs, diminution in cough and expectoration, and almost complete disappearance of tubercle bacilli. At the same time the general condition remained grave, and ulcers appeared on the exposed parts. The use of the rays was discontinued, and during the next three weeks great improvement took place. The patient, who had hitherto refused food, regained her appetite, the healing of the pulmonary lesions continued, together with the diminution of the cough and the bacilli, and the greater ease and depth of respiration. The diarrhœa disappeared and the strength returned;

the temperature alone kept up (101° in the evening), which the authors explain as being probably due to bacillary infection of some other part than the lungs. The authors conclude that, without discussing the question of a permanent cure, in thirty sittings the X rays have favourably affected and almost healed lungs affected with acute tuberculosis, no other medicinal agent being employed at the time." But we have all seen similar improvement without the use of the rays, given rest in bed and good food. And the major part of the improvement seems to have followed the disuse of the rays.

B.—PNEUMONIA.

1. Serotherapy.

The most important contribution to our knowlege of serum treatment in pneumonia has been made this year by **Washbourn**. In the *Brit. Med. Journ.* of February 27, 1897, he gives a full account of the method of inoculation of the pony used to obtain the serum, and the means by which the serum was standardised:—

"Before using the serum for the treatment of pneumonia in the human subject, it was necessary to ascertain, first, whether it would protect animals when injected after infection, and, secondly, whether large quantities produced any ill effects.

"In the following experiments the serum was injected into the peritoneal cavity of rabbits at different periods after inoculation. The tables show that a single dose of 66 units' serum protects when injected five or six hours after inoculation, but that the same quantity injected as late as eight or twelve hours only retards the fatal event. It will be observed that the controls died in twenty-four to twenty-six hours, and therefore recovery ensued when the treatment was begun in the first quarter of the disease.

"TABLE VIII.

Rabbit S	1,500 g.	0·0000001 loop	Died in 24 hours
„ T	1,500 g.	0·000001 loop	Died in 24 hours.
„ U	1,600 g.	0·000001 loop. Six hours later, 2 c.cm. serum (66 units)	Alive 6 weeks later.
„ V	1,600 g.	0·000001 loop. Eight hours later, 2 c.cm. serum (66 units)	Died in 4 days.

"TABLE IX.

Rabbit W	2,750 g.	0·000001 loop	Died in 24 hours.
„ X	2,400 g.	0·000001 loop. Twelve hours later, 2 c.cm. serum (66 units)	Died in 48 hours.

"TABLE X.

Rabbit Y	2,350 g.	0·000001 loop	Died in 26 hours.
" Z	2,500 g.	0·000001 loop. Five hours later, 2 c.cm. serum (66 units)	Alive 2 months later.

"The following experiments show that large doses of the serum produce no ill effects on rabbits:—

"Rabbit 1: 5 c.cm. serum injected into the peritoneal cavity. No rise of temperature ensued, and the animal lost neither weight nor appetite.

"Rabbit 2: 10 c.cm. serum injected into the peritoneal cavity. No rise of temperature ensued, and the animal lost neither weight nor appetite.

"From the foregoing experiments it will be seen that the serum possesses the power of protecting animals against infection when injected either at the same time or subsequent to inoculation. It is impossible to say whether it possesses antitoxic powers, because hitherto no satisfactory toxin has been obtained from cultivations of the pneumococcus.

"The serum should be injected into the subcutaneous tissue, and strict aseptic precautions should be taken. The skin should be well washed with an antiseptic, and the syringe should be boiled immediately before use. As to the dose, 20 c.cm. (660 units) should be injected. I would suggest that the injections be made twice a day until the patient is convalescent. It is important to commence the treatment as early in the disease as possible."

The number of cases in which this treatment has been used is rapidly growing. Some of the reports give good reason for hoping that valuable results will be obtained. Among the cases published, one of the best is Dr. Washbourn's own.

A. H., 25, law writer; admitted December 10, 1896, into Guy's Hospital under care of Dr. Washbourn.

Previous history.—Was in the army, and was stationed in India for five years. Returned to England last month. Has been a heavy drinker.

History of present illness.—Was seized with a rigor at 4 p.m. on day before admission. Was very sick during the night.

December 10. *Condition on admission.* — Temperature 101·4°, respirations 44, pulse 140; tongue furred; skin hot and dry; rapid shallow breathing; pain in right side of chest; harsh vesicular murmur at right base, but no other physical signs in lungs; first cardiac sound rather blurred, and impulse to be felt in line with nipple and half an inch external; urine

contains trace of albumin. A mixture containing acetate of ammonia ordered every six hours. At 10 p.m. temperature 103·8°; patient delirious, attempting to get out of bed; ¼ gr. morphine injected.

December 11. Coughing up a little rusty sputum. On right

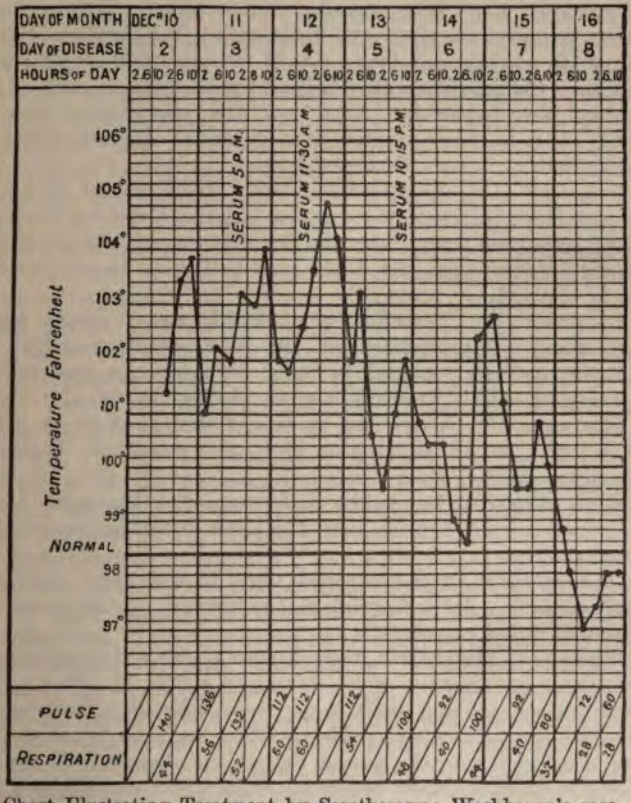

Chart Illustrating Treatment by Serotherapy: Washbourn's case.

side of chest behind there is dulness at the base, extending up to angle of scapula. Tubular breathing, bronchophony, *râles*, and a pleuritic rub audible over dull area On the left side behind there is diminished resonance at the base extending up to angle of scapula. Small area of tubular breathing, and bronchophony,

just below angle of scapula. The apex beat still displaced outwards. Strychnine added to mixture, and 2 oz. of brandy ordered daily. At 1 p.m. very restless and delirious, $\frac{1}{6}$ gr. morphine injected. At 4 p.m. the dulness on the right side had increased upwards for two inches. At 5 p.m. 660 units anti-pneumococcic serum injected (20 c.cm.).

December 12. Has passed a quiet night. This morning better; the physical signs are unaltered. Temperature 102·6°, pulse 112, respirations 60. At 11.30 a.m., 660 units serum injected. During the day patient was restless, and $\frac{1}{6}$ gr. morphine was injected. At 6 p.m. the temperature rose to 104·5°. At 11 p.m. patient was delirious; $\frac{1}{6}$ grain morphine again injected; brandy increased to ℥ iv.

December 13. Temperature 100·4°, respirations 33, pulse 104. On the right side the dulness has decreased by 2 inches; tubular breathing faint. On the left side the tubular breathing replaced by fine *râles*. At 10.15 p.m. 660 units serum injected. Brandy omitted.

December 14. Passed a quiet night, and is much better this morning. Temperature 99°, pulse 92, respirations 36. On right side dulness replaced by impaired resonance, and tubular breathing by *râles*. Left side has completely cleared.

December 15. There was a rise of temperature to 102·8° during night, but it has fallen to 99·4° this morning. Patient is now convalescent.

From this time he rapidly recovered. On December 17 the heart sounds were normal, and the apex beat had returned to normal position.

On December 18 the physical signs in the chest had completely cleared. An urticarial rash appeared on the chest and limbs, and lasted two days.

Remarks.—The patient, though young, was a bad subject for pneumonia, on account of his intemperate habits. The attack was a severe one, and both lungs were affected. There was a good deal of delirium; the pulse was 140, and the heart showed signs of dilatation on the second day of the disease. The serum appears to have exerted a beneficial effect upon the disease. On the day after the first injection the pulse-rate had fallen from 132 to 112. The process in the left lower lobe never advanced after the treatment was begun. It will be observed that the serum was injected at an early stage—namely, on the third day of the disease. In both cases an urticarial rash was observed during convalescence similar to the rashes occurring after injection with antitoxic and antistreptococci sera.

Renzi, using a serum prepared in a similar manner, reports equally well.

2. Treatment by large doses of digitalis.

Barth (*Sem. Méd.*, Dec. 25, 1896; *Brit. Med. Journ. Epit.*, Jan. 23, 1897) discusses the treatment of pneumonia by the administration of large doses of digitalis continued without interruption until defervescence occurs. He instances two patients who were successfully treated in this way, one an elderly man worn out with hard work and strong drink; the other a feeble, neurotic patient, deformed by spinal curvature, and suffering from malaria, influenza, and general bronchitis. Large doses were given. Two grammes of the powdered leaves of digitalis were infused in 100 gr. of water, 25 gr. of rum and of infusion of orange peel added, and a tablespoonful of the mixture given every two hours. **Hirtz**, of Strassburg, demonstrated that the average duration of fever was markedly shortened, and never met with a case of poisoning or serious ill effects in the course of treatment by digitalis. **Petrescu** (Bucharest) gave to young robust soldiers suffering from pneumonia 6 to 8 gr. daily for several days. He observed no *malaise* or toxic effects. The temperature fell 1° to 3° in one day, 5° to 6° in two days. Out of 825 cases he had only 17 deaths. **Finkl** reduced his mortality from 17 per cent. to *nil*. He gave small doses—2 to 3 gr. Under the combined influence of the mechanical obstruction of the pulmonary arterial area and the paralysing action of the pneumococcic toxins the heart is liable to failure; this is the chief, if not the only, danger, and is the one met by the administration of digitalis. Large doses may cause complete fall of temperature, but this artificial defervescence twenty-four to forty-eight hours earlier than the normal is not proved to be advantageous. It is frequently followed by a rise, and the course of the disease is not perceptibly shortened. As regards symptoms following the administration of digitalis, hypothermia, slowing of the pulse, vertigo, and cerebral depression are without gravity in the young and robust; but with old, alcoholic, or weak patients it is better to employ it in doses calculated to increase the action of the heart, to diminish the congestion of the lung, and to facilitate the diuresis necessary for the elimination of pneumonial toxins. All grave cases of pneumonia in which treatment by baths is contra-indicated or impracticable should be treated by the administration of digitalis.

3. The treatment of pneumonia by formate of sodium.

"An interesting paper on this subject by **M. Rochon** appears in

a recent number of *Médecine Moderne* (No. 105, p. 805, 1896). It is known that cultures of the pneumococcus, on almost any medium, cease growing after a few days, and that this cessation of growth is associated with the formation of formic acid. It was found also that formic acid added to a young culture at once stopped its growth. On these grounds Rochon was led to try the effect of its salts in several cases of pneumonia, three of them being children. These were all suffering from typical acute pneumonia, and formate of soda was administered to them in doses of 4 to 8 gr. In all the temperature fell on the third or fourth day, the physical signs persisting for a few days longer. At the same time, large doses of brandy were given, so that it is not quite clear to which drug the result was due. Rochon believes that the alcohol becomes converted into aldehyde, and that this may aid in the conversion of formic acid into formic aldehyde, which is an extremely powerful antiseptic. In support of this theory he states that the presence of aldehyde in the urine can be demonstrated by its reducing an ammoniacal solution of silver nitrate. In future he intends to employ the formic aldehyde itself, which, he says, is easily taken. He also speaks favourably of the value of formate of soda, in a 4 per cent. solution, as a gargle in a case of tonsillitis occurring during the course of pneumonia." ("Treatment," vol. i., p. 1.)

4. Creasote.

Casati (*Gazz. degli Osped. e delle Clin.*, April 11, 1897; *Brit. Med. Journ. Epit.*, Aug. 8, 1897), with the idea that creasote is a cardiac and nervine stimulant, was led to try it in twenty-six cases of pneumonia, forming part of a somewhat serious epidemic of that disease. The only case recorded in detail by the author is that of a man, aged seventy, who was given creasote on the third day of the disease, and recovered. Some of the cases were treated with creasote (in tincture of gentian) alone; in others this was supplemented by digitalis or caffeine in small doses. The author believes that the cases treated with creasote recovered more rapidly and more thoroughly than those treated in other ways. He pushed the drug freely, but never saw any unpleasant symptoms follow its use.

C.—WHOOPING COUGH.

1. Ozone.

The possibilities of ozone in whooping cough have again been receiving attention. In the *Brit. Med. Journ. Epit.*, April 3 and 10, 1897, are records of several observations.

Labbé and **Oudin** (*Archives d'Electricité Médicale*, December 15, 1896) report excellent results from the use of ozone in the treatment of whooping cough. Two, three, or four inhalations are given daily, each lasting from ten to fifteen minutes. Owing to the great irritability of the throat in these cases, the authors commence by using the ozone produced by the silent discharge from an induction coil giving an inch spark, and by holding the child some distance away from the tube. Later the patient is brought nearer to the tube, the capacity of which is increased, the power of the coil being at the same time doubled. The effects are rapid diminution in the paroxysms, improvement in the general condition, gain in weight, and increase in oxyhæmoglobin.

Doumer (*Nord Médical*, No. 50, 1896) reports his experience of this method. He treated five cases—brothers and sisters and mother, all suffering from whooping cough of a fortnight's to a month's duration, with paroxysms of medium severity, varying in number from twenty to sixty a day. The ages of the patients ranged from three to thirty-five years. The treatment consisted in the inhalation of ozone for ten to fifteen minutes twice a day. The results were as follows: In four cases in which sleep at night was much broken, there was improvement after four inhalations. In one case in which vomiting was severe, it was speedily checked. In all the cases there was diminution both in the frequency and in the severity of the paroxysms from the second day; discontinuance of the inhalations, however, being always followed by relapse. A cure was effected after twelve to twenty-seven inhalations—that is, in nine to fifteen days. There was no relapse in any of the cases two months and a half later.

2. Exalgin.

Green, of Sandown, records the very satisfactory results he has had with a combination of exalgin and amonium bromide during the last four years. For a child of four years his routine treatment is to give a single dose in the morning, and a double dose in the evening of the following mixture: Ammon. Brom. gr. ij, Exalgin gr. j, Syr. Tolut. ♏ xxx, Aq. ad. ʒj. If there is much bronchitis, Ammon. Carb. gr. j and Vin. Ipecac. ♏ j are given every hour in sweetened water. This mixture also counteracts any depressing effect which the exalgine may have. As the spasms become less frequent the dose of the exalgin may be diminished. Green insists that "it is necessary for rapid recovery that the patients should be kept in one atmosphere, and should not be allowed out of doors *until quite cured*." Otherwise

a sharp relapse, with severe pulmonary complications, is apt to occur. ("Treatment," i., 5.)

3. Resorcin.

Roskam (*Ann. de la Soc. Méd. Chir. de Liége*, Feb., 1897; *Brit. Med. Journ. Epit.*, March 27, 1897) since 1890 has treated 290 children suffering from whooping cough by the method introduced by Moncorvo, namely, by applications of a 2 to 3 per cent. solution of resorcin to the glottis with a fine sponge. Before the date mentioned he had used Moncorvo's method in its entirety—that is to say, before applying the resorcin he anæsthetised the glottis by the application of a 10 per cent. solution of cocaine. Finding, however, that this was apt to cause severe spasm, he used the resorcin without previous cocainisation. In this way eighteen out of twenty-five children were cured in ten days. In three others in whom a relapse occurred, a definitive cure was effected in three weeks. Two cases proved refractory to the treatment, and in two others death occurred from weakness, although the severity of the paroxysms was mitigated. In the 290 cases treated since 1890 no other therapeutic measure of any kind was employed, in order that the effects of the resorcin might be tested as fairly as possible. The treatment was generally begun within the first fortnight of the illness, but in many of the cases it had existed for three weeks, and was of a very severe type. In 200 cases cure was complete within a fortnight; in seventy before the twenty-fifth day of the illness; in eighteen before the thirtieth day. In two cases (brother and sister) in which relapse occurred, a further course of applications of resorcin brought about a cure. Children under two years of age seemed to get well more easily than older ones. Infants under one year were, "in the immense majority of cases," cured in about a week from the first application of the resorcin. Roskam thinks it important to wait till the initial congestive stage is past and the "whoop" is fairly established before commencing the applications, as in that period they are apt to cause irritation. In children under one year a 2 per cent. solution should be used; in those between one and two, a 2 per cent. and then a 3 per cent.; from two years upwards, a 3 per cent. solution. The applications should be made every four hours, beginning at 6 a.m., and once or twice in the night. Improvement in the general condition shows itself within two or three days; in five or six days the paroxysms become shorter in duration and less severe. When the applications have been continued for ten or twelve days they should be suspended. Very often recovery takes place without further treatment; if not, after an interval of five or six days the applications may be

resumed for some days. It may be added that after a few applications by the practitioner the treatment is carried out by those in charge of the patient.

D.—THE TREATMENT OF BRONCHITIS.

In a discussion of the Hunterian Society, Nov. 25, 1896 (*Trans.* 1896-7) **Arthur Davies** brought forward a number of cases demonstrating the value of some of the less-used methods in the treatment of chronic bronchitis. The *spray of ipecacuanha wine* advocated by **Sidney Ringer** and **Murrell** very often proves of service. "The manner of employment consists in spraying by means of an ordinary hand-ball spray apparatus, or the steam atomiser of Siegle or Richardson, the ipecacuanha wine, either alone or diluted in a proportion of 1 to 3 of water. The patient is directed to inhale as deeply as possible, at the same time closing his nose with his fingers. The amount sprayed at a single sitting consists of 1 to 4 dr.—100 squeezes of the hand-ball are equivalent to 1 dr. of the spray used. The patient must also be directed not to swallow any of the spray which may accumulate in the mouth, but to spit it out. . . . It tends at once markedly to relieve the dyspnœa and so promote sleep, and to shorten the duration of the case. Each patient spontaneously remarked that the breathing was easier, and the oppressive tightness across the chest relieved, and that the deeper the inhaled spray seemed to penetrate into the lungs the more relief they obtained. What are the disadvantages? In hospital practice it is, of course, an easy matter to carry out the treatment systematically, but it is not so in private practice. The amount of the spray must be carefully regulated, as at first it is sometimes not well borne, and tends to induce vomiting, and sometimes severe paroxysmal dyspnœa. The strength of the spray requires careful adjustment."

Another spray tried is a 1 per cent. solution of potassium iodide. This also will relieve some cases of dyspnœa, and is especially useful in asthma and in persons of a gouty tendency.

Sänger, in the *Centralblatt für inn. Med.*, 1897, No. 17, records results from the use of hydrastis Canadensis. He has used the drug for a considerable time in chronic bronchitis, and thoroughly satisfied himself of its value before reporting. The dose is 20 to 30 drops of the liquid extract four times a day. In many cases of chronic bronchitis he has found that it eases cough, diminishes quantity of sputa, and renders it thin and easy to bring up. The results last also for some time. The drug is useless in acute bronchitis.

Hector Mackenzie, in the *Practitioner*, April, 1897, p. 411, abstracts two interesting papers on the bacteriology of bronchitis.

S. Dessy has made some bacteriological researches upon cases of acute bronchitis occurring in the Military Hospital of Florence (*Lo Sperimentale*, 1896, p. 325). He isolated a coccus which in some respects resembled a diplococcus and in others a streptococcus. The bacterium rapidly lost its virulence, so that the author was unable to make researches as to specific immunity after the method of Pfeiffer. It had many of the characters attributed by various authors to the streptococci of the mucous membranes normally occurring in the mouth, vagina, etc., and ordinarily little or not at all pathogenic. The author thinks it probable that these streptococci ordinarily present in the mouth in some way acquire virulence in the bronchial mucous membrane.

G. Carrière has published a detailed account of a case of streptococcic chronic bronchitis treated with great benefit by antistreptococcic serum (*Presse Méd.*, Paris, June 5, 1897, p. 258). In this case there were febrile temperature, profuse sweats, and abundant expectoration in the morning. There were the general signs of bronchitis with emphysema, together with some evidence of a cavity at the left apex. The sputum was repeatedly examined, and while it contained neither bacilli nor elastic fibres, streptococci were constantly found to be present. After an injection of 10 c.cm. of antistreptococcic serum, the temperature first rose, but soon fell to normal, and improvement set in. A fortnight later the expectoration had greatly diminished in amount, not exceeding 5 or 6 oz., and was more mucous and less purulent. There was general improvement, although the physical signs were unaltered. A second injection of the same amount was made. Three weeks after the second injection the patient left the hospital greatly improved. The cough was slight, and the expectoration only amounted to between 1 and 2 oz. The cavity signs disappeared. In a month the patient was quite well.

THE TREATMENT OF NERVOUS AND MENTAL DISEASES.

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This article includes the following subjects :—

I.—Lumbar Puncture.
II.—The Treatment of Epilepsy.
III.—The Ætiology and Treatment of Tabes Dorsalis.
IV.—The Treatment of Pain, including Local Anæsthetics.
V.—The Treatment of Insomnia.
VI.—The Treatment of Tetanus.
VII.—Thyroid Extract and Serum in Insanity.
VIII.—Miscellaneous Articles.

Special attention has been directed to further observations on lumbar puncture, to the treatment of epilepsy by opium and bromides, the results obtained at epileptic colonies, the relationship of syphilis to tabes, and the treatment of ataxia by systematic exercises.

I.—LUMBAR PUNCTURE.

In "The Year-Book of Treatment" for 1897 will be found a full account of what is known as Lumbar Puncture. This method of ascertaining the pressure of the cerebro-spinal fluid, together with its chemical, microscopic, and bacteriological constituents, was there shown to be of some distinct service in the differential diagnosis of various forms of meningitis and of brain tumour. It was shown, however, by many observers that even for diagnostic purposes the proceeding did not yield infallible results, that as a means of treatment its use was almost *nil*, and that it occasionally hastened, even if it did not cause, death.

In medical literature during the past twelve months further observations have been made, which only confirm the general conclusions just mentioned. Full use does not, however, seem to have been made of the operation, as in most of the cases reported

the pressure of the fluid has not been ascertained, and this, according to Quincke, is one of the most important diagnostic points.

Mya (*La Settimana Med.*, Jan. 23, 1897) points out that, even in cases in which the removal of some liquid may be palliative, it occasionally happens that the sudden diminution of pressure leads to death. In the acute non-tuberculous affections of the meninges lumbar puncture can have little curative effect, though it may be of use in hydrocephalus following a chronic meningitis. When operating on children chloroform was not given, and in some cases the patients walked home immediately after the operation. He alludes to thirty-three cases, fifteen of which suffered from tuberculous meningitis, two from serous meningitis accompanied by the staphylococcus, one from syphilitic lobar sclerosis, three from cerebral tumour, eleven from chronic hydrocephalus, and one from sinus thrombosis after otitis. Mya speaks highly of the diagnostic value of the method in tuberculous meningitis, and points out how in this disease the liquid flows at a quicker rate; for example, 20 to 40 c.cm. in a few minutes, compared with 5 to 10 c.cm. in the same time in other cases. The fluid is slightly turbid, and coagulates if left to stand. Microscopically, fragments of ependyma and leucocytes in small quantities were found. Glucose is usually less than normal, and may be absent. Tubercle bacilli were found only in two cases, and cultivations were not successful. The author relates one case of tuberculous meningitis diagnosed by puncture and by injection of tuberculin, which recovered. The other fourteen cases of tuberculous meningitis ultimately died.

Thiele (*Deut. med. Wochen.*, 1897, No. 24) has used the method in twenty-four cases, and concludes that it is a valuable addition to our methods of diagnosis, and may be of use therapeutically in serous and sero-purulent meningitis and in the cerebral disturbances of chlorosis.

Wentworth (*Arch. of Pediatrics*, Aug., 1896) summarises as follows:—The normal cerebro-spinal fluid contains neither cells nor fibrin, and is perfectly clear, whereas in meningitis the fluid withdrawn is invariably cloudy in proportion to the character of the meningeal exudation; the cloudiness is caused by cells, which differ according to the form of the meningitis, and the presence of the cells and appearance of fibrin after withdrawal is pathognomonic of meningeal inflammation. The differential diagnosis between the various forms of meningitis can be made by microscopic examination of the sediment, by cultures, and by inoculation experiments. In normal fluid a faint trace ($\frac{1}{50}$ per cent.) of albumen is found, but in meningitis this is increased, and may vary from $\frac{1}{50}$ to $\frac{1}{10}$ per cent. In one of his cases a diagnosis of

general infection by the staphylococcus pyogenes aureus was made from cultures of the cerebro-spinal fluid.

Wilms (*Münch. med. Wochen.*, 1897, No. 3) has operated thirty times on twenty-three patients. In four cases of epidemic cerebro-spinal meningitis he found Weichselbaum's meningococcus twice; in a third patient sudden death took place two hours after the puncture, and in the fourth case no bacteria were found, but after the removal of 100 c.cm. of clear fluid complete recovery occurred; five cases of tuberculous meningitis ended fatally, and in only one of these were the tubercle bacilli found. In several cases there was a remission of the symptoms for a short time after the puncture. Of three cases of pseudo-meningitis with infectious disease, one ended fatally, and no bacilli were found. In a case of chronic nephritis and uræmia no increased pressure of the fluid was present. In syphilitic meningitis no therapeutic effect was noticed; in a case of chronic hydrocephalus with enormous cranial distension, but with no brain pressure symptoms, no increased pressure was found, but in the serum were traces of albumen and a little sugar. He found no increased pressure in chlorosis. In a case of cerebral tumour the pressure was increased to 66 mm. of mercury (normal pressure about 5 mm. of mercury), whilst in a case of cerebellar tumour with pressure symptoms no increased pressure of fluid was found, probably due to the tumour shutting off the spinal canal from the cerebral meningeal spaces and ventricles. In epidemic meningitis, with one exception, the fluid was turbid and purulent, but in tuberculous meningitis it was nearly always clear; and also in pseudo-meningitis with infectious fevers and syphilis, in uræmia, embolism and tumours, the fluid was always clear.

Habel (*Deutsch. med. Woch.*, October 15, 1896) mentions that in Eichorst's clinique, lumbar puncture has been performed twelve times. In eight cases the disease was tuberculous meningitis, and yet the bacillus was found only once. Of the remaining cases two were purulent meningitis (in which the fluid drawn off was purulent), one was a serous meningitis which ended in recovery, and one was a syphilitic meningitis. In all the tuberculous cases clotting of the fluid occurred after a few hours, whereas clotting was not noticed in the other cases.

1. Lumbar puncture in the complications of ear disease.

Leutert (*Münch. med. Wochen.*, February 23 and March 2, 1897) discusses the diagnostic value of lumbar puncture in the intracranial complications of ear disease, such as meningitis, sinus thrombosis, and combined sinus thrombosis, and cerebral abscess.

The diagnosis between sinus thrombosis and meningitis is not always easy, and yet is very important in the early stage as an indication for operation. Details of twelve cases are given, including two of suppurative meningitis; two of suppurative meningitis and sinus thrombosis; one of sinus thrombosis with intra-dural and cerebral abscess; one of sinus thrombosis with multiple cerebral abscesses; one of suppurative meningitis with cerebral abscess; one of perisinuous abscess; and one of sinus thrombosis. Details are also given of one case of cerebro-spinal, another of tuberculous meningitis, and a third of serous meningitis. All the cases except the perisinuous abscess, and one of epidemic meningitis, ended fatally. In the author's first case death occurred fifteen minutes after the puncture, but the patient was already almost moribund. In these cases negative evidence is often of value. The presence of a large quantity of fluid shows that the communication between the brain and cord cavities is open. In purulent meningitis the fluid contains more or less inflammatory products, so if these are absent in cases diagnosed as sinus thrombosis or cerebral abscess, then meningitis may be excluded. Uncomplicated sinus thrombosis may undoubtedly produce an excess of cerebro-spinal fluid. In cases of sinus thrombosis with cerebral abscess the exclusion of meningitis (by lumbar puncture) would lead to a successful operation on the sinus, and then the symptoms of pressure due only to the abscess may be apparent. Cultivation experiments were negative in five out of seven cases examined. A considerable number of leucocytes present in the fluid makes the diagnosis of meningitis very probable. In one case mentioned a subperiosteal abscess behind the ear was opened, and two or three weeks later cerebral symptoms appeared. Lumbar puncture was performed, but no tubercle bacilli were found, although the autopsy revealed a general tuberculosis.

2. Lumbar puncture in general paralysis and melancholia.

Babcock (*State Hospitals Bulletin*, 1896) has used the method in twelve cases of general paralysis of the insane. The skin was first injected with cocaine. No bad results were seen. It is generally accepted that the increased cerebro-spinal fluid is at first inflammatory in nature, but afterwards merely compensatory; but in all cases albumin was present in it. There was some excitement after the operation; the expression was less vacant, but the pupils were unchanged; the ataxia was slightly improved, but the hesitation of speech scarcely changed. If there was a very deep stupor, the operation should be performed. The fluid

generally returned, demanding renewed interference; the albumin was increased, but the specific gravity was lowered. In more than 50 per cent. of the cases the operation produced good but transitory results, and, as repeated puncture would be necessary, the use of the treatment in general paralysis is probably of no service. Babcock found the method useless in melancholia with pressure symptoms.

3. Lumbar puncture in lead encephalopathy.

Seegelken (*Münch. med. Woch.*, 1896, No. 47) describes a case of lead encephalopathy in a painter's assistant in which right-sided convulsions were followed by right hemiplegia and deep coma, with absent knee-jerks, but a normal urine. By lumbar puncture 60 c.cm. of cerebro-spinal fluid were withdrawn, the pressure of the fluid at the beginning registering 310 mm. of water, and at the end 80 mm. Soon after the operation there was a return of consciousness and lasting improvement. The fluid was at first almost clear (probably from the spinal sub-arachnoid space), but the latter portions (probably from the brain) were turbid.

II.—THE TREATMENT OF EPILEPSY.

During the past year no new treatment of epilepsy has been published except that by *extract of pituitary body* by **Mairet** and **Bosc** (*Arch. de Physiolog. norm. et pathol.*, July, 1896), who found that repeated feeding with the pituitary glands of oxen produced no effects in dogs, and subcutaneous injection of the gland in water only gave rise to slight transitory fever and a little wasting; intravenous injection of the fluid produced death by coagulating the blood. In healthy man the gland, taken by the mouth, was not followed by any change, but injection caused slight general *malaise* and fever lasting for twenty-four hours. The gland was given by the mouth or subcutaneous injection to twenty-one epileptics. It was found to increase, rather than diminish, the number of fits, and in addition it produced a state of mental exaltation which, in some cases, was quite different from any previous mental aberration from which the patients had suffered.

Cividali and **Gianelli** (*Lancet*, Jan. 30, 1897) report that *duboisin sulphate* diminishes the number and intensity of epileptic attacks; the dose given was $\frac{1}{120}$ grain, increased to $\frac{1}{60}$ grain, and the most favourable results were obtained in cases of epilepsy associated with psychical disorders.

The majority of the articles on the treatment of epilepsy relate to the treatment by large and *increasing doses of opium followed by large doses of bromides*, as proposed about two years

ago by **Flechsig**. The method has received much adverse criticism, and but few of the many trials have had encouraging results. **Böhme** (*Zeitsch. f. Psychiatrie*, vol. liii., p. 30) treated ten cases in this way, and of these five showed an absence of fits for some months, and three others were slightly improved. With some patients the fits increased during the opium treatment, and several patients showed symptoms of poisoning. Böhme doubts the use of the opium administration. **Bratz** (*Neurolog. Centralbl.*, 1897, p. 47) says that many think the method, not only useless, but even harmful, as during the time when the large doses of opium are being given, severe delirium and even death may occur. He reports his results in forty-three cases. Of these, twenty-four showed no good effect, and there were three cases of death; with only a few cases was the result good. During the opium period of treatment the majority of the cases were miserable, the skin was cold, and the body-weight decreased, but when the bromide was given the body-weight increased. Some of the cases suffered from slight delirium, and there was often a feeling of giddiness. **Jastrowitz** (*ibid.*) had never seen any good from the method, but **Oestreicher** (*ibid.*) mentioned a severe case which had received benefit.

Pollitz (*Allgemein. Zeitsch. f. Psych.*, vol. liii., p. 37) tried the treatment in seventeen cases, but with no specially good results. He warns others against using the method, because of the symptoms of poisoning, the loss of weight, the increase in number of attacks during the opium treatment, and the numerous deaths which have occurred. He thinks that the theoretical basis of the cure is very assailable, and the practical results, if one excepts those produced by the bromides, doubtful.

Van Gehuchten (*Polyclinique*, 1896, No. 3) used Flechsig's treatment in a weak-minded epileptic, twenty-three years of age, who had suffered for two years, and had latterly five to eight attacks daily, which were not relieved by any of the usual methods of treatment. The intensity of the attacks diminished early in the stage of opium treatment, whilst the number lessened as soon as the bromides were given. The improvement was so great that for twenty days there was no attack. The opium was well borne, on the whole, with the exception of some vomiting, loss of sleep, and constipation, which occurred towards the end of the opium-administration period.

Flechsig (*Neurol. Centralbl.*, Jan. 15, 1897) criticises the unfavourable results of his treatment which have been recorded by others, and utters a note of warning that it is only suitable for inveterate cases of epilepsy which have withstood all other

treatment, and that the greatest care is requisite during the course of the cure. He considers that in the fatal cases recorded no causal relation to the treatment has been shown, and points out that a fatal result is common enough in status epilepticus without any opium administration. A careful watch should be kept by the physician for any untoward symptoms which would indicate withdrawal of the drug; indeed, Flechsig is more inclined to blame the physician than the drug for the fatal result. His own experience of the treatment by opium and bromides has been most satisfactory; six cases out of fifty so treated have had no recurrence of the fits for two and a quarter years, and all the cases treated were severe and of many years' duration, and had resisted all previous treatment. He does not use the opium method until he has first ascertained that the bromides alone are of no service. If the opium is given, then the patient must be treated as if he were seriously ill; he must be kept in bed, and must have constant skilled nursing and medical attention.

1. The behaviour of bromides in the body.

Laundenheimer (*Neurol. Centralbl.*, 1897, p. 538) found in a series of experiments that, contrary to the usual opinion, the bromides do not leave the body within twelve to thirty-six hours after they are taken, but are only excreted by degrees, and increase the excretion of chlorine, taking its place in the body to a large extent. After a certain time, in a period of bromide administration, a kind of bromide equilibrium is established, the bromide taken in and that excreted being about the same. The author thinks that possibly bromism is due to the increased excretion of the chlorides, and suggests that sodium chloride should be given as a remedy for the bromism. In some cases there was noticed a lessening of the urine before an epileptic seizure came on, whereas during the period of opium administration of Flechsig's treatment there was a considerable increase in the flow, and, in fact, this was the cause of the loss of weight, as the urine was greater in amount than the fluid ingested. It was also noticed that after the opium administration the lessening of the urine before an attack was no longer present, which may have some connection with the success of Flechsig's method in some cases.

2. The treatment of epileptics in "colonies."

No annual review of the treatment of epilepsy would be complete without a reference to the good work which is being carried on in so-called epileptic colonies. An interesting review of this subject, together with the results obtained at the colony established at Chalfont St. Peter, has been published by **Aldren Turner**

(*Lancet*, June 26, 1897), and deserves more than a passing notice. The author points out that a return of the Local Government Board in 1893 stated that in the Poor Law institutions of London there were 34,889 inmates, of whom 604 were sane epileptics, or about one-fifth of the probable number of sane epileptics in the Metropolitan area. This large number at once suggests the question as to whether it is not possible for these individuals to support themselves by work under proper care and supervision. In Germany colonies for this purpose have for long been established, and at Bielefeld 1,100 epileptics are employed in various forms of field and garden work. Other similar institutions are to be found at Zürich, Potsdam, and Stettin; and in America at the Craig Colony in New York State there are 145 patients employed and 23 epileptic children in the schools. In England until two years ago there were only two small homes for epileptics, one at Maghull, near Liverpool, founded in 1889, for both male and female patients, and Lady Meath's Home for Epileptic Girls.

In 1894 the National Society for the Employment of Epileptics opened the first house at the epileptic colony at Chalfont St. Peter, Buckinghamshire. The principles upon which this colony is worked are:—(*a*) Removal of the epileptic from the town to the country; (*b*) the regular employment in the garden, fields, orchard, workshops, etc.; (*c*) the maintenance of a well-ordered and regular mode of life, with the avoidance of excitement and abstinence from alcoholic liquors; (*d*) abundance of good nourishment of a simple nature. Living under such conditions, it has been found that the epileptic requires only a minimum amount of medicinal treatment, and it is the custom to give each patient 30 grains of potassium bromide at bedtime. There are at present two houses, each containing eighteen males, and one for twenty-four females. Another building for men is being erected, and it is proposed to build two houses and a school for male and female children. Payment has been made either by the friends of the patients or by Boards of Guardians. Since August, 1894, sixty-two male epileptics have been under observation.

As regards the results obtained, Turner summarises as follows:—(1) *Frequency of fits.* In the majority of cases a marked diminution in the number of attacks has been observed after admission, probably due directly to the removal from bad hygienic surroundings in a town to a pure country air. In a minority there was a temporary increase in the number of fits, which may have been due to the fact that previous to admission large doses of bromide had been taken, which are stopped on

admission, except for the single nightly dose. After a time the average number of fits is struck, which, of course, varies in different cases. The greater number of fits occurred during the day, and by far the commonest time is during the first hour after rising in the morning. Fits are rare on going to bed, and, as a rule, the patients are much better and brighter during the evening. More fits occurred in the house than outside, and probably more during warm and close weather than during cold. (2) *Severity of the attacks.* In the majority an amelioration in the severity of the attacks occurred, in a minority no alteration was noticed, and in a few the attacks were more severe. In some, severe fits gave place to attacks of *petit mal*, in others attacks of an average nature became more severe. (3) *General mental state.* In quite a minority there has been a progressive tendency towards dementia. In some it appeared to be the natural course of the disease, and in others it was owing to the frequency and severity of the fits. In the majority, however, no such mental deterioration was observed. Some are able to do work requiring individual alertness and tact, while most are able to do work under supervision. But the greatest benefit of the treatment consists in the good general moral effect upon the patients, for here they are not regarded as "family lepers," but each patient finds that he can be of use, and interest is taken in the work and amusements, and there is a feeling of higher self-respect. (4) *General physical state.* It is here that the greatest improvement has been noticed. All the patients put on weight, notwithstanding the frequency or severity of any fits which may have occurred.

It has been found that all forms of work in field and garden are most beneficial, but good work has also been done in the carpenter's shop by picked men. The farm of 135 acres is worked by the colonists, with the addition of a few farm labourers, a bailiff, and a gardener. In the summer months cricket matches are played, but football is forbidden. The granting of holidays at intervals has been found of benefit.

The patients for admission are carefully selected, the special points to which attention is directed being:—Has the epileptic been unable to obtain employment? Or, has he been discharged from situations by reason of his fits? Is he capable of work under supervision? Is he absolutely free from attacks of violence, mania, or every symptom indicating insanity?

III.—THE ÆTIOLOGY AND TREATMENT OF TABES DORSALIS.

A.—THE ÆTIOLOGY OF TABES DORSALIS.

At the International Congress at Moscow there was a discussion on the ætiology of tabes dorsalis (*Neurol. Centralbl.*, 1897, p. 873). **Borgherini** thought that the causes of tabes should be divided into the general and the special; in his experience there was a history of syphilis in 30 per cent. of the cases. **Leyden** did not think that it was proved satisfactorily that syphilis was the great cause of tabes, and was not content with the statistical method in this connection; he thought it might be just as easy to prove that gonorrhœa or cold was the great cause. The syphilitic theory did not explain why tabes was so uncommon in women; and he thinks that in men many previous diseases are put down to syphilis, although they have been nothing of the kind. Virchow had further noticed that in autopsies on tabetic cases other signs of syphilis were very rarely seen. Leyden does not believe that the disease begins in the spinal cord, but that it is a parenchymatous change which begins in the sensory and motor nerves.

Erb said that for the last twenty years he had carefully collected his own cases, and found that in 6,000 patients suffering from other forms of nervous disease, there was a history of syphilis in only 20 per cent; whereas, in 1,000 cases of tabes, there was a previous history of syphilis in 90 per cent. He said that it was notorious that tabes did not appear in married people unless there was a previous history of syphilis, so that the condition could not be due to sexual excess. He believed that heredity played only a small part in the ætiology, and then only if syphilis had been present. **Heuschen** mentioned that in his clinique there were but few cases of syphilis, and but few of tabes.

Hermanider (*Virchow's Archiv*, Bd. cxlviii.) discusses this subject on the basis of hitherto published statistics. He points out that the percentage of cases of tabes put down as due to syphilis varies from 92·5 (Erb) to 30·6 (Leyden), and thinks the personal equation must be considered in these statements. In most of the statements—except those of Erb—there is no comparison with healthy or non-tabetic individuals as regards previous syphilitic history, and it is only by such a comparison that a reliable estimate can be made. Hermanider suggests that sexual excess is also a potent cause but here, of course, there is more

chance of syphilis. He mentions the proximity of the genital centre in the lumbar region to the part first affected in tabes. He further brings forward the possible connection between gonorrhœa and tabes, although proof is still wanting, in spite of many researches. In conclusion, Hermanider thinks the connection between syphilis and tabes is very probable, but by no means certain, and he decidedly combats the view that syphilis is the only cause of tabes, whether as a predisposing or as an essential cause.

Trennan (*Alienist*, Oct., 1896) states his opinion that syphilis is only put down as a cause of tabes because it is so common in the white races. He remarks that in Japan, where syphilis is so frequent, tabes is very rare; and that in Arkansas, where syphilis is very common among the negroes, he has not seen a single case of tabes among the black races in twelve years. He calls attention to the possibility that the long and uninterrupted use of iodide of potassium in large doses may damage the blood-cells, and indirectly the intima of the vessels, producing thereby an arteriosclerosis, and so possibly setting up tabes. [This seems to us to be rather a gratuitous hypothesis.—E. S. R.]

Collins (*The Post-Graduate*, July, 1896), after a study of the nervous diseases supposed to be due to syphilis, says: (1) That exudative and degenerative diseases of the nervous system due to syphilis are most liable to show themselves at the end of the third and the beginning of the fourth decade of life. (2) Thorough and prolonged administration of anti-syphilitic remedies during the activity of the virus does not seem materially to prolong this time limit. (3) Active and prolonged anti-syphilitic treatment does not seem to prevent the development of such diseases as tabes dorsalis or general paralysis; and further, that the cases in which syphilis is acknowledged, and in which treatment has been most desultory and incomplete, are not more liable to the earlier development of, or to severe manifestations of, these diseases than those cases are in which the treatment has been all it should have been. (4) The administration of anti-syphilitic remedies in the most approved way does not fulfil the requirements of cure, and thus syphilis is often an incurable disease.

Lead-poisoning as a cause of tabes.

Redlich (*Wiener med. Wochen.*, 1897, Nos. 18 and 19) says that, although most of the cases of tabes are probably due to syphilis, yet a certain number are probably due to other poisons. He has investigated the influence of lead as a cause, and could find only four cases out of one hundred of tabes in which this

connection probably existed. One of these cases he relates, in which, after death, there were found changes in the posterior columns, and also a poliomyelitis in the anterior horns of the upper cervical region.

B.—THE TREATMENT OF TABES DORSALIS.

1. Exercise treatment of tabes.

Frenkel (*Deutsch. med. Wochen.*, Dec. 17, 1896) has during the last six years treated a number of ataxics by regulated exercises, a method first introduced by himself. Improvement in the ataxia was almost always obtained, and much more may be expected from this method than is usually believed. The author divides co-ordinated movements into: (*a*) Those which maintain the body or part of the body in a given position (static co-ordination); (*b*) those which regulate the change of position of the whole body, as in walking, etc.; (*c*) those which effect co-ordinated movement of one or more parts of the body when the centre of gravity is left out of consideration, as in movements of the arms, legs, &c., in the sitting or lying position. Inco-ordination may affect one or more of these groups; (*a*) represents the lightest, and (*c*) the most serious forms of ataxia. The object of treatment is to convert the simplest ataxic movement into a normal one, and this can be effected by the exercises. These consist of exercises for the hands and arms, and exercises for the body and lower limbs. Examples of the former are:—Sit in front of a table, place the hand upon it, then elevate each finger as far as possible; then, raising the hand slightly, extend and then flex each finger and thumb as far as possible; do this with the right and then with the left hand. Touch with the end of the thumb each finger tip separately and accurately; then touch the middle of each phalanx of each finger with the tip of the thumb. Sit at the table with a large sheet of paper and a pencil; make a dot at each corner of the paper and one in the centre, and draw lines from the corner dots to the centre dot, first with the right and then with the left hand. Put ten pennies on the paper, pick them up and place them in a single pile, first with the right, then with the left hand. For the body and lower limbs sample exercises are:—Sit in a chair, rise slowly to erect position without help of cane or handles of chair; then sit down slowly. Stand with cane, feet together, advance left foot and return it; then same with right. Walk slowly ten steps forward and five back with help of cane. Stand without cane, but with the feet a little apart, and the hands on hips; in this position stoop down by flexing the knees, and rise

slowly. Stand without cane, with the feet separated, raise the hands from sides to above the head, carry them downwards and forwards, and try to touch the toes. Walk along a fixed line on the floor by help of a cane, placing each foot in turn on the line; then repeat without using cane. Most of these exercises should be repeated several times. Other similar exercises can be invented from time to time, if necessary.

Insufficient duration of the treatment or an unsuitable selection of exercises may give rise to an insufficient result. Frenkel draws attention to the absence of the feeling of fatigue in locomotor ataxia. In these cases great care is needed to find out the suitable form of exercise required. The treatment is not without benefit even in cases in which there is marked disturbance of sensation. The movements should be made with the eyes both closed and open. Possibly in the earliest cases these exercises may be a means of warding off the ataxia. The improvement may last for years, if the disease is stationary or only slowly progressive. With the intelligent patient it is possible to adapt the exercises to the actual state of the disease, even if slowly advancing. Frenkel says the treatment is absolutely contra-indicated in cases of acute or sub-acute ataxia, and relatively contra-indicated in cardiac valvular disease and marked arthropathy. No good results can be expected when other diseases of the nervous system are present. Attention is drawn to the harm that may be done by passive movements and injudicious active movements, including those against resistance; instances are given in which fracture, blood effusions, weakness in the legs, etc., have been known to follow such efforts. Prudence should be used in recommending walking exercise, as, the feeling of fatigue being absent, over-exertion may lead to increased ataxia; and the least fatigue felt should lead to great caution. Sport of all kinds should be forbidden, and especially cycling, even in the earliest stages, for any advantages gained by the improved co-ordination is lost by the baneful effects of over-exertion.

At the Moscow Congress Frenkel (*Neurol. Centralbl.*, 1897, p. 879) further stated that the worst cases could only be satisfactorily treated by those who had an exact knowledge of the methods, but in light cases good results could easily be obtained. The ataxia of the unburdened lower extremities (as in lying), of the burdened lower extremities (as in standing), and that of the trunk, must all be considered specially. Exhaustion by the exercises must be carefully avoided. For the treatment of the lower extremities complicated apparatus is unnecessary, but the treatment of the upper extremities requires special apparatus. In

a regular course of treatment the exercises must be performed two or three times a day, and always under the direction of the physician. It is probable that if used in the pre-ataxic stage the threatening ataxia might be combated. The results are lasting. Treatment by baths should be forbidden while the exercise treatment is being used.

Kalinin (*Vratch*, No. 7, 1897) has used Frenkel's method in five cases of tabes with great improvement in the condition of the patients. He arrives at the following conclusions:—(1) By this treatment the loss of motion can be restored to a satisfactory degree, the gait and locomotion gradually becoming safer and firmer. (2) The sense of locality and that of movement, and the skin sensibility, are but little improved. (3) Romberg's symptom (swaying on standing with the eyes closed and the feet together) very soon becomes less pronounced. (4) The duration of the treatment should entirely depend upon the prognosis and degree of the motor disturbances present, but in any case it should not amount to less than a month. (5) No ill-effects were observed if the treatment was interrupted at short intervals of two to three weeks, but not longer.

Raichline (*Neurol. Centralbl.*, 1897, p. 473) has applied this method in twelve cases—with complete success in eight, relative success in three, and with no good effect in one case. He thinks the method is applicable even in very advanced cases, and the effects are lasting; not only the ataxia, but also the sensibility and the bladder troubles were improved. The conditions of success are a long, as opposed to a short, course of treatment, a well-nourished condition, good sight necessary for watching the movements accurately, a certain amount of energy and intelligence, not complete loss of sensibility, and the absence of arthropathies or fresh fractures.

2. General treatment of tabes.

A most interesting and valuable paper on the treatment of tabes was given by **Erb** at the International Medical Congress at Moscow (*Neurol. Centralbl.*, 1897, p. 875). He deals with the subject under several heads: (1) *Review of former treatment.* Romberg declared that in no disease was there so little hope of cure. After this time derivatives, baths, and drugs were employed; then the faradic current was recommended by Duchenne, and the galvanic by Remak; nitrate of silver being given internally by Wunderlich, and such drugs as ergot, arsenic, iodine and bromine preparations, strychnine and tonics by others. Besides these, animal extracts, such as testicular juice, spermin, spinal cord and brain substance were given. Massage, gymnastics, systematic

movements, suspension, and nerve-stretching (with or without operation) have all been recommended.

(2) *Ætiology and nature of the disease.* There is no doubt that syphilis is responsible for most of the cases of tabes, although some doubt this. It is certainly a point for discussion as to how syphilis gives rise to the disease: whether it is a true tertiary symptom, or whether it is a post-syphilitic or metastatic syphilitic affection (from a toxin), or whether it should be considered as a disease due to some agent acting on a cord weakened by syphilis. Besides syphilis, cold, fatigue, sexual excesses, trauma, excess in alcohol or tobacco, overstrain and emotion, may be occasional causes, perhaps acting more as immediate causes.

(3) *Result of the modern therapeutics of tabes.* It has been determined without doubt that the early and thorough treatment of syphilis will lessen the appearance of tertiary manifestations, but even the most thorough early treatment will not absolutely prevent the appearance of tabes. It is, however, necessary to treat the early stages of syphilis as thoroughly as possible. Anti-syphilitic treatment should also be used in the early stages of tabes, when the infection by syphilis is not very remote or where there has not been a thorough early treatment of the syphilis. Erb considers that the systematised movements proposed by Frenkel are of real service in lessening the ataxia.

Grasset (*ibid.*) at the same Congress considered that in tabes we have only one part of a general disease which may be characterised as a multiple disseminated sclerosis; for we find scattered, discontinuous lesions of the nervous system, often also other clinical signs, such as polyneuritis, lateral sclerosis, etc., and often sclerosis of other organs, such as the heart and arteries, and often diabetes. The principal cause of tabes is syphilis, but in addition we must consider as factors arthritis, different intoxications, and hereditary or acquired predispositions; and thus he thinks that syphilis is merely a co-agent. From this standpoint, tabes may be considered a curable disease. In treating these cases, one must try to cure the disease and improve the anatomical condition of the spinal cord, to improve the destroyed functions of the spinal cord, and to lessen the pain and other symptoms. We must, therefore, use: (*a*) Agents to modify the cause of the disease, such as anti-syphilitic or anti-rheumatic remedies. (*b*) Agents to modify the lesions, such as iodine preparations or, if these cannot be borne, silver, and, in acute or subacute attacks, ergot. For the spinal cord itself, local derivatives, electrotherapy, and stretching of the nerves or cord itself may be employed. Suspension is chiefly useful in chronic

cases, and it must be long-continued. (*c*) Agents for lessening pain, such as opium, antipyrin, chloroform, warm water, electricity, &c. For the muscular weakness and asthenia massage and hydrotherapy may be used. Frenkel's method is useful for the ataxia, and suggestion for the neurasthenia.

Raichline (*ibid.*) agrees that, except in the early stages, anti-syphilitic treatment is of no use in tabes, nor is anti-syphilitic serum of any value, and the organic extracts can have no other influence than that of mere tonics. On the contrary, hydro-therapeutics, electrotherapeutics, massage and gymnastics, are of great service, together with fresh air and good nourishment.

Brower (*ibid.*) thinks that a warm, dry, and equable climate is necessary for tabetics, together with great ease and quiet, daily massage, electricity, and methodical exercises; he also recommends the use of gold chloride and zinc phosphate.

IV.—THE TREATMENT OF PAIN, INCLUDING LOCAL ANÆSTHETICS.

A.—THE TREATMENT OF PAIN.

1. Tic douloureux, facial neuralgia, and migraine.

Gilles de la Tourette (*Sem. Méd.*, June 24, 1896) says that, from a therapeutic point of view, it is most important to distinguish two classes of facial neuralgia. The first is transitory, and usually due to cold and peripheral irritation; but the second is refractory, and perhaps incurable. In the first form the pain during the attacks is not very intense, but is not entirely absent between the attacks; the onset is sudden, then there is an acme and a decline. The second form, or tic douloureux proper, is completely paroxysmal, the pain being entirely absent between the attacks; its maximum intensity is reached quickly, and it ceases as suddenly as it came on, the whole time of attack being of short duration. There may be ten to a hundred attacks in the day, which are often brought on by physiological acts, such as blowing the nose, laughing, mastication, or they may come on spontaneously. The patients compress the painful spot, and the face is contracted. Secondary vasomotor symptoms are infection of the eye, œdema of the eyelids, and discharge from one nostril. If the lingual nerve is affected, the mouth fills with a copious secretion; herpes along the course of the nerve is common. Most often the neuralgia lasts some time, even weeks or months, and then vanishes completely for a period. However, as age advances these intervals tend to become shorter, and the painful periods

longer, until the disease is permanent. A hysterical variety can be distinguished from the true by the irregular occurrence of the attacks (perhaps one a day, and then no more for some time), by the actual duration being longer, by the usual presence of auræ, and by the frequent termination in hysterical convulsions, which are never provoked by true neuralgia, though hysteria and tic may co-exist.

The first form of facial neuralgia is always benefited by analgesics, such as antipyrin, phenacetin, or hydrobromate or valerianate of quinine. The second form, or true tic, is quite uninfluenced by these drugs, and the only drug which can be relied on is opium in large doses. The author gives it in freshly-made pills, containing $\frac{1}{3}$ grain of the thebaic extract of the French pharmacopœia; three pills a day are given at first, and, the effect being carefully watched, one pill is added every other day until the desired effect is produced. The maximum dose is continued for a few days, then gradually diminished by one pill every alternate day. The attacks, cured for a time, almost always return, and intolerance of opium is usually more marked during the second than during the first course. It is, however, the best treatment, unless syphilis is present, when ordinary anti-syphilitic treatment should be tried.

Migraine differs entirely from trigeminal neuralgia, though the two may co-exist in the same person and be quite distinct. The author considers that the best treatment in obstinate cases is to give bromides, starting with 30 grains a day for a week, and then raising the daily dose by 15 grains every week, and after a time reducing progressively by the same amount, when it is again increased. One hundred grains a day may be tolerated. By this means migraine of years' standing may be completely cured, but the treatment must be absolutely continuous, and may have to be persevered with for more than a year. Thus the method is unsuited for slight cases, owing to the inconvenience attending upon the long course of bromides; the treatment also is useless during the attacks; alcohol is forbidden. This treatment will be seen to be the same as for epilepsy, the disease being looked on as a neurosis allied to that affection.

Dana (*Chicago Med. Record*, 1896) treats tic douloureux by hypodermic injections of increasing doses of strychnine, then by iodide of potassium, and tonics, such as large doses of tincture of iron, rest in bed with low diet and diuretics. The patient must take the full course, and sometimes even a second or third course. The strychnine is given hypodermically in simple daily doses, beginning with $\frac{1}{30}$ grain, very slowly increased until by the

fifteenth or twentieth day a dose of from $\frac{1}{8}$ to $\frac{1}{4}$ grain is given, but most patients cannot take more than $\frac{1}{5}$ grain. These large doses have an anodyne effect like morphia. After reaching the maximum dose, the drug should be continued for a week or ten days, and then gradually reduced so that by the end of five or six weeks the initial dose is reached. The drug is then stopped, and 5 grains of iodide of potassium (increased to 20 grains), together with 5 minims of tincture of iron (increased, if possible, to 20 minims), are given twice daily. In some cases salicylate of potassium is given instead of the iodide or nitroglycerine is added. Rest in bed is essential. At the end of four weeks the patient is allowed to go out for two hours daily, and at the end of six weeks he can go about his work. Out of six cases of very old-standing neuralgia, relief was obtained in all but two, and in one of these the method was not fully tried.

2. Osmic acid injections in neuralgia.

Franck (*Fortschr. der Med.*, August, 1896) records some results of the treatment of neuralgia by injections of osmic acid. In three cases, varying in duration from two to nine years, where other modes of treatment had failed, this drug caused a rapid cessation of pain. In the one case the patient was a woman, aged twenty-seven, who had suffered for four years from neuralgia so severe that she lost her hair. Partial relief was given by division of the infra-orbital nerve, but the pain still persisted in the supra-orbital region. This was completely cured by injections of osmic acid, and the hair grew again. The solution used was a 1 per cent. solution, and 1 to 5 minims were injected on each occasion. The best results are obtained by injecting the acid directly into the nerve affected, and so the treatment is more effectual where the nerve is superficial. The pain at the moment of injection is intense.

3. Douches in sciatica.

Borischpolski (*Neurol. Centralbl.*, Dec. 1, 1896), adopting the view that sciatica is due to disturbances of the circulation followed by the accumulation of the products of metabolism in the affected nerve, has used the Scottish douche (hot water followed by cold) in 32 cases of sciatica. Of these cases 23 were cured, 7 were improved, and 2 were unimproved. **Bechterew** (*ibid.*) agreed that these douches were of great service, especially in long-standing cases of sciatica.

4. Compression in traumatic neuritis.

Occasionally one meets with extremely difficult and obstinate cases where intense pain is caused on touching a cicatrix. **Delorme** (*Journ. de Méd.*, June 25, 1896) puts forward a new

method of treatment for these, and relates ten cases. One was after a bullet wound in the neck, with neuralgia for twenty-three years, although the cicatrix was removed several times by operation; the least touch or draught on the cicatrix caused pain. In a second case a soldier injured the last phalanx of the index-finger, and for several months complained of severe pain shooting up the rest of the hand and up the arm. In all his cases Delorme first defines the exact extent of the painful area; then the patient, either sitting or lying, is supported by assistants, and the operator compresses the painful part, such as the finger, between his own finger and thumb with all his strength. This is done successively over the whole extent of the hyperæsthetic area over and round the cicatrix, beginning at the most painful part. If, after the first application, which lasts only a few seconds, any hyperæsthesia remains, the operation is repeated after a few minutes' rest, and this may even be done a second or third time after a few days' interval. After the operation the compressed part is wrapped up for eight or ten days in wool. After this treatment the part may be touched without pain, sensation is unaltered, and even trophic changes may disappear. The author does not employ a general anæsthetic for fear of syncope, nor a local one, as this would hide the extent of the painful area.

5. Comparative study of analgesics.

Kuttey (*Therap. Wochensch.*, July 5, 1896) gives a comparative study of the value of ten reputed analgesics in nine cases of pain from nervous disease, including tabes, chronic and compression myelitis, disseminated sclerosis, and intracranial sarcoma. The drugs employed were phenacetin, antifebrin, lactophenin, neurodin, migrainin, agathin, euphorin, exalgin, anti-nervin and malakin, and in all about 700 observations were made. Of all these drugs phenacetin and malakin were considerably better and safer than the others. Neurodin was also of much value, followed in order by antifebrin, exalgin, migrainin and lactophenin. Euphorin and anti-nervin were but of slight use, and agathin was of less value than any. The most marked diaphoretic action was produced by malakin, the least by exalgin and antifebrin. Idiosyncrasy plays an important part in determining the efficacy of analgesics. In compression myelitis the severe pain was only relieved ninety-one times out of a hundred, the pain being only subdued by morphia.

6. Pyramidon.

This is a new antipyretic and analgesic derived from antipyrin, and has been experimented with and used therapeutically by **Lépine** (*Lyon Méd.*, June 13, 1897). He says it is about two

or three times stronger than antipyrin. In dogs ·2 gramme per kilo. of body weight is fatal in a few hours. He gave it to twenty patients without bad results, and, in most of the cases, with benefit. In a case of tabes with lightning pains which antipyrin and morphia had not relieved, dozes of 10 grains of pyramidon three or four times a day were successful, and quite removed the pains for several weeks. This dose is, however, a large one, and he usually only gave 4 grains three or four times daily. The drug was useless in a severe case of neurasthenia.

B.—LOCAL ANÆSTHETICS.

1. Eucaine.

Spencer (*Univ. Med. Magazine*, Nov., 1896) has used eucaine hydrochlorate (a complicated synthetical compound: see "Year-Book of Treatment," 1897, p. 461) in twenty cases as a local anæsthetic in minor surgery, and found it most serviceable. When the solution is to be injected, as in the case of punctured wounds, tumours, etc., ʒj-ij of a 5 per cent. solution will be generally sufficient to cause complete anæsthesia. When the drug is to be applied to a raw surface or to a mucous membrane, if the surface is large it is best to apply ʒj of a 5 per cent. solution to the part, then saturate a piece of cotton with a similar amount of the same solution, and allow this to remain in contact with the surface for five minutes. At the end of this time the area can be lightly curetted without pain. After this, two more drachms of the solution should be applied in the same manner. In eleven of the cases anæsthesia was complete within five minutes after the application, and in seven cases it was complete in three minutes after. No systemic effects of the drug were observed in any of the cases. Eucaine is rapid in action, safe and efficient, and its solutions can be sterilised by boiling. **Leguen** (*Méd. Mod.*, Oct., 28, 1896) points out that the toxicity of eucaine is less than that of cocaine—6 cgrm. of cocaine killing a guinea-pig in three-quarters of an hour, whereas 8 cgrm. of eucaine only killed one of the same weight in one hour and a half. He used 8–10 ccm. of a 1 per cent. solution for injection under the skin, and 100–200 ccm. of a 1 in 500 solution for injection into the bladder. He considers that the only drawback to the drug is that it causes congestion of the part to which it is applied. **Somers** (*Therap Gaz.*, Jan. 15, 1897) has used eucaine (4 per cent. solution in water) in nasal operations. He found that cocaine usually produced anæsthesia in three to five minutes, the condition lasting twenty to thirty minutes, but eucaine only caused anæsthesia in eight to ten minutes, lasting twenty minutes. In active inflammatory

conditions it is best to use a mixture of cocaine and eucaine, as their opposite actions on the blood vessels neutralised one another. Eucaine may be kept indefinitely in a sterilised watery solution. These conclusions have been generally confirmed by **Gibb** (*Philad. Polyclinic*, Jan. 23, 1897), who used it in throat and nose conditions; by **Charteris** and **MacLennan** (*Proc. Roy. Soc. Edin.*, 1895-96), and by **Hobday** (*Journ. Comp. Path. and Therap.*, March 29, 1897), who says that it is quite as good as cocaine for operations on the cornea, but not so good as cocaine when injected subcutaneously in horses, dogs and cats; he says, however, that a mixture of cocaine and eucaine is equal to cocaine alone and can be tolerated in larger doses.

Pouchet (*Sem. Méd.*, Feb. 3, 1897) thinks that the toxic equivalent of eucaine is almost equal to that of cocaine, and acts on the heart with an intensity equal to if not greater than that of cocaine.

2. Holocaine.

This is another new substitute for cocaine, and is a crystalline substance which may be looked upon as a combination of a molecule of phenacetin with a molecule of phenetidin, a molecule of water being set free. A review of its properties is given by **Prof. Leech** (*Medic. Chron.*, June, 1897). It forms crystalline salts soluble with difficulty in cold, but easily in hot water; the watery solutions are neutral and not decomposed by long boiling. The hydrochlorate of holocaine is the preparation employed, and cold saturated solutions contain about 2·5 per cent. of the salt. So far it has been chiefly used for eye surgery, two or three drops of a 1 per cent. solution causing anæsthesia of the cornea in half to one minute, lasting ten minutes. It is a poisonous drug, so injections into the subcutaneous tissue should not be used. It has no effect on the tension of the eye, on the size of the pupil, nor on accommodation. No bad effects have been seen from its application to the cornea. An abstract of the various published papers on holocaine is given in Prof. Leech's review.

V.—THE TREATMENT OF INSOMNIA.

1. Pellotin.

Pilcz (*Wien. klin. Wochens.*, 1896, No. 48) records the results of his investigation with this new hypnotic, prepared by Heffner from *anhalonium williamsii*, and so strongly recommended by Jolly, according to whom two grains of the hydrochloride of the alkaloid can be injected subcutaneously without causing any effect beyond that of refreshing sleep. Pilcz used the drug in fifty-eight

cases of insomnia, giving one-third of a grain as a minimum dose. The patients were inmates of lunatic asylums. In twenty-nine cases a perfect result was obtained, the patient falling asleep within one hour and a half, and remaining so all night; a moderate effect was seen in seventeen cases, while in the remaining twelve the remedy was ineffectual, though of these latter Pilcz considers that four were not fair tests. Of the successful cases, nineteen reacted to the minimum dose, and none of the others required more than one grain. Curiously enough, the author himself was refractory, one-third of a grain only giving him half an hour's sleep. The beneficial effects were sometimes very marked in cases where other hypnotics had failed. Thus one-third of a grain of pellotin produced sleep in one patient who had resisted sixty minims of paraldehyde, and another who was unaffected by seventy-five minims. Pilcz did not observe the slowing of the pulse noted by Jolly, or the collapse seen in one case by Langstein. He did not try to obtain any anodyne effects. In two cases only was there giddiness, and one of these cases was a paranoic with sensory hallucinations. The drug appeared to be particularly valuable because it can be given subcutaneously without trouble. As regards dosage, he recommends one-third to two-thirds of a grain repeated two or three times if necessary.

2. Trional.

Drews (*Wien. med. Presse*, 1896, Nos. 13 and 14) thinks that trional is an ideal hypnotic in doses of fifteen to thirty grains in adults and three to fifteen grains in children, producing sleep in a quarter to half an hour. It has no accumulative effect, and causes no habituation and no gastro-intestinal disturbances. There is but little risk of poisoning even after very large doses. It is also an analgesic, and, in sufficient doses, may produce sleep even in painful conditions. It acts more rapidly than sulphonal, and its hypnotic effect lasts for six to eight hours. To prevent hæmato-porphyrinuria (only one case of which has been seen after trional) the dose should never exceed thirty grains. It should not be taken dry or followed by cold water, but only with a cupful of some fluid, such as soup, tea, or milk, taken as warm as possible. It is to be occasionally discontinued, and some carbonated mineral water should be taken with some vegetable acid to keep the blood alkaline, and the bowels should not be allowed to be constipated.

[We think this author rather under-estimates the possible dangers of trional. Although it has appeared to us to be safer and to have fewer after-effects than sulphonal, yet acute poisonous symptoms have resulted from sixty grains taken in twenty-four

hours, and at least two cases of hæmatoporphyrinuria have been recorded. See "Year Book of Treatment," 1897.—E. S. R.]

Köster (*Therap. Monatsh.*, 1896) has used trional in all forms of sleeplessness, in doses of fifteen to thirty grains, given in warm milk shortly before bedtime. Generally the result was very good, sleep coming on within an hour, and he noticed no bad symptoms or after-effects. In alcoholic delirium, the attempt to substitute trional for chloral failed, and he found the drug of little use in painful affections, although it was of much service in severe asthmatic cases.

VI.—THE TREATMENT OF TETANUS.

1. Tetanus antitoxin.

Höffling (*Deutsch. med. Wochen.*, April 1, 1897) relates the case of a boy in whom symptoms of tetanus appeared one week after an injury to the hand. Five days after the onset there were very marked spasms; on the eighth day 5 grammes of dry antitoxin from the Höchst factory, dissolved in 45 c.cm. of sterilised water below 40° C., were injected, and slight improvement occurred. Two days later there was great difficulty of breathing from spasm of the diaphragm. The next day a second injection was given, and this was followed by considerable improvement and ultimate recovery.

2. Carbolic acid.

Poli (*Gazz. degli Osped.*, March 14, 1897) had a case of a boy who had been kicked on the foot by a horse, and five days later tetanus set in. He was admitted into hospital on September 28, the part was excised and cleansed with carbolic acid and iodoform. Potassium bromide and chloral were given internally, together with injections of 1 per cent. carbolic acid every two hours. Nicolaier's bacillus was found in the excised portion. On September 30 the spasm was less, but on October 2 the trismus and opisthotonos were still well marked; on October 4 the carbolic acid injections were given every hour, and on October 16 the boy was perfectly well. Nearly five hundred injections were given in all, but no bad symptoms were noticed.

3. Mercury perchloride.

Hendley (*Brit. Med. Journ.*, 1897, vol. i., p. 138) at first administered chloral hydrate in a case of tetanus the cause of which was unknown, but no great effect followed. It was, however, continued, and in addition $\frac{1}{12}$ grain corrosive sublimate was injected into the buttocks twice daily. After the first two injections the spasms decreased markedly, and after eleven injections ceased entirely.

4. Veratrum viride and gelsemium.

Fordyce Grinnell (*Med. News*, July, 1896) gives the case of a boy six years old in whom tetanus came on nine days after injury. Three days after the onset tr. veratr. virid. was given, at first in 1 minim doses every hour and then 2 minims every hour; and from time to time the fluid extract of gelsemium was given in doses of from 1 to 3 minims hourly. The tr. veratr. was increased to 3 minims hourly. These drugs were continued for forty-eight hours until the spasms ceased and then gradually reduced. During the whole time 4 grains of ammonium bromide were given every two hours. Recovery occurred in sixteen days.

VII.—THYROID EXTRACT AND SERUM IN INSANITY.

1. Serum therapy in mental and nervous diseases.

Mairet and **Vires** (*Nouv. Montpellier Médical*, No. 8, 1897, p. 14) conclude from a series of observations of the action of various serums upon mental and nervous diseases, as follows:—1. Pure artificial serum given by hypodermic injection has no appreciable therapeutic effect in epilepsy nor in mental disease. 2. Artificial serums with medicinal substances in solution only act as carrying the drugs more rapidly into the circulation. Such drugs as bromide of potassium, ergotine and phosphoric acid given in this way seemed to have no effect whatever, but urethane controlled maniacal excitement more rapidly, given hypodermically with artificial serum, than when simply by the mouth. 3. The blood serums of the rabbit and dog gave some positive results, that of the latter being more potent. 4. While serum therapy would appear to be useless in hysteria, in epilepsy and in those forms of mental disease associated with exaltation, it is useful in cases where depression is present; in such cases temporary stimulation is obtained which may be made to continue under repeated injections; permanent cures were not, however, obtained. The bodily functions were stimulated and this might account for the relief of the mental condition.

The same authors (*Sem. Méd.*, Aug. 19, 1896) report that they had injected serum taken from a patient cured of acute mania into two women suffering from acute mania. In one of them each injection was followed by the onset of marked drowsiness, but afterwards the agitation was as great as before. In the other case twenty similar injections were given, the dose being 5 c.cm., and here each injection was followed by a feeling of drowsiness, buzzing in the ears, and then heavy deep sleep.

Definite improvement was at first noticed, but a relapse occurred and the agitation became as bad as ever. A second series of injections of doses of 20 c.cm. in the twenty-four hours was given; similar symptoms followed the injections as those occurring before, but the improvement which followed was persistent and finally the patient was cured. [Surely this recovery cannot be considered as a cure by serum! Cases of acute mania have been known to recover long before the serum treatment was heard of.—E.S.R.]

2. Thyroidin in insanity.

Shulansky (*Vratch*, No. 33, 1896) has tried Merck's thyreoidinum siccatum in fifteen cases of chronic mental disease principally suffering from secondary dementia, and found that the frequency of the pulse was increased and became softer but fairly strong. In some patients there was a rise of temperature. The body-weight at first decreased, then remained at a minimum, and after discontinuing the drug increased markedly. The influence of the drug on the mental condition was nil and in some cases fibrillary muscular twitchings and increased perspiration occurred. Prolonged administration produced gastro-intestinal disturbance.

VIII.—MISCELLANEOUS.

1. The ætiology of disseminated sclerosis.

Strümpfell (*Neurol. Centralbl.*, Nov., 1896), while admitting the occasional occurrence of disseminated sclerosis after the acute specific fevers, does not agree with Marie that these are usually the cause of the disease; nor does he consider that a toxic origin is common, for out of twenty-four of his own cases only one seemed possibly due to a poison (in this case, lead). A primary affection of the blood vessels seems equally improbable, as the changes in the nervous system are quite unlike those seen in arteriosclerosis or syphilis, nor are they such as would be caused by ischæmia from narrowing of the lumen of the vessels. Strümpfell would rather consider the affection to be of congenital origin and to be endogenous, not exogenous. He was led to this conclusion by a case in which hydromyelia with a central gliomatosis of the cord was combined with well-marked disseminated sclerosis. This combination, which can hardly be accidental as he has recorded another similar case, suggests the true pathology of the disease. The theory of congenital origin is also supported by the early commencement of the disease, which almost always begins in youth and occasionally in childhood. Further, almost all the exogenous diseases of the nervous system soon

affect the axis-cylinders, or even the nerve cells themselves, whereas disseminated sclerosis spares them until very late. The irregular distribution of the sclerosis suggests that the change starts in the neuroglia as a multiple gliomatosis of congenital origin; and this would explain the early affection of the nerve sheaths rather than of the axis-cylinders. Acute illnesses, traumata, etc., are not excluded from the ætiology of the disease by this theory, for they may act as exciting causes, as they undoubtedly do in hereditary ataxia, the endogenous origin of which is generally accepted.

2. Percussion of the spine in diagnosis.

Bechterew (*Neurol. Centralbl.*, Dec., 1896) points out the diagnostic value of percussion of the lower part of the spine. In the sacral region over a triangular area with its base at the upper part of the sacrum, and its apex at the top of the coccyx, there is normally a slightly tympanitic note. In cases where there is some morbid change, as in a case where the cauda equina was compressed by a fungoid tumour, the percussion note was definitely altered. Localisation of a lesion may thus be facilitated; in the case mentioned the localisation was proved to be correct by an autopsy.

3. The prognosis and treatment of aphasia.

Karl Bok (*Festsch. des Stuttgart. ärtzlich. Verein*, 1897) says that the prognosis of aphasia depends on the site and nature of the lesion. Incurable lesions may preclude improvement even in the slighter cases of aphasia. Extensive progressive lesions are, of course, worse than circumscribed ones. Hæmorrhage, embolism, and thrombosis include the bulk of the causes of aphasia. If death does not occur, even the worst disturbances of speech may be recovered from, whilst on the other hand slight affections of speech may remain for life. Age is an important factor in prognosis: children may learn to speak again even after extensive damage to the speech-centres, while small lesions in old people may produce a lasting aphasia. The individual power of learning undoubtedly plays a part in the result. The longer the aphasia has lasted without any tendency to improvement the worse the prognosis, and this is also the case where the intelligence steadily fails. In the didactic treatment of aphasia it must be taken into account whether the lesion is capable of recovery; whether it has progressed slowly or quickly; and whether the intelligence is involved. It is well to let some time elapse before commencing the treatment, in order to ascertain more accurately whether the result is due to the treatment or not. The kind of aphasia, whether motor, sensory or amnesic, must also be taken into account.

The object of treatment is to restore the conduction of impulses

along the usual paths, or to open up new paths. The treatment of amnesic aphasia lies in strengthening the defective recollection of words. The words must be learned by heart, and then short reading exercises adopted. The exercises should be performed in front of a mirror, in order to recall the necessary movement to the recollection. In motor aphasia other parts of the brain may take on the function of the part destroyed. Single sounds, then syllables, and lastly words are taught, and writing exercises with the left hand should be performed with the articulation exercises. The patient should be taught to form words from printed letters. The treatment of sensory aphasia is more difficult. The first attempts are made by means of written language. Lip reading should be developed, and reading, writing, and other exercises combined with it. The case may be much complicated by the combination of different forms of aphasia. In the absence of complete recovery a considerable improvement may be obtained in these cases by patient teaching.

4. A symptom of chronic cocainism.

Rybakoff (*Neurol. Centralbl.*, Aug., 1896) points out the diagnostic value of Magnan's symptom in chronic cocaine poisoning. This consists of a hallucination of common sensation; the patient complains of feeling some foreign body under the skin. In some cases the foreign bodies felt are said to be like grains of sands, in others they feel larger than this and more or less rounded, and again are sometimes described as being microbes, crystals, worms, etc., situated just under the skin.

5. Kolanin.

Dornblüth (*Berl. klin. Wochens.*, June 21, 1897) draws attention to the stimulating effects of the kola nut. The investigations of Knebel and Hilger have shown that the nut does not contain any alkaloids, but a glucoside to which the name of "kolanin" has been given. In the ripe or dried fruit this may be split up into glucose and caffein, which necessitates a very careful preparation of the nut if the glucoside is to be retained. Kolanin is decomposed either by the saliva or the gastric juice. Dornblüth has used it in tabloid form in many patients. He found that it rapidly restores the strength after exhausting work without any ill effects. It is considerably superior to caffeine. In one case, however, that of a hystero-neurasthenic woman, 3 grains of kolanin produced a feeling of uncertainty and trembling in the hands. In neurasthenics the good effects produced were only temporary. In neurasthenic cardiac depression the drug was of temporary benefit. In migraine a beneficial effect was obtained, as well as in headaches following upon mental over-exertion or alcoholic excess.

DISEASES OF THE STOMACH, INTESTINES, AND LIVER.

By Herbert P. Hawkins, M.D., F.R.C.P.,
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The past year cannot lay claim to any marked advance in the treatment of abdominal disease by drugs or medical means. It shows, however, a steady widening of the sphere of abdominal surgery. Physicians are placing more reliance on surgical aid. The surgeon appears on the scene at an earlier point of the illness, and the successes gained are proportionately greater.

1. Surgical treatment of non-perforated gastric ulcer.

The necessity of operation in a case of perforation of a gastric ulcer at the earliest possible moment is, of course, now generally recognised, and some instances will be given illustrating the complications that may arise. But there is a movement in favour of the surgical treatment under certain conditions of a simple gastric ulcer which has not perforated. These conditions must be carefully considered.

Leube detailed the results of his practice at the German Surgical Association (*Centralbl. f. Chirurgie*, No. 28, 1897). His treatment consists of rest in bed, poultices, Priessnitz douches, Karlsbad water, and a carefully regulated diet. Drugs are scarcely used, comprising only occasionally sod. bicarb., and for constipation rhubarb with sulphate and bicarbonate of soda. Of 556 cases so treated, 74 per cent. were cured and 22 per cent. improved, while 1·6 per cent. remained uncured, and rather more than 2 per cent. died. There is clearly not much opportunity for surgery here, but Leube reckons that in a small proportion (4 per cent.) surgical intervention is indicated. He would confidently recommend operation in cases of "small but frequently repeated hæmorrhages" from the stomach. On the other hand, a "single profuse hæmorrhage," such as arises from the sudden opening of a large artery, he does not regard as necessarily requiring surgical intervention; but if such large hæmorrhages

should be repeated, then in his opinion the question of operation comes up at once, each case being considered on its own merits, due regard being paid to the strength of the patient and the condition of the pulse. In considering such a case, it must be remembered that deaths from hæmorrhage are rare and, further, that for successful interference a previous diagnosis of the exact position of the ulcer is of great importance; and such a diagnosis he admits is not possible. In the next place, indication for operation (especially gastro-enterostomy) is sometimes afforded by the "intense pain and urgent vomiting," which point to spasmodic closure of the pylorus. Such a condition is dangerous by producing inanition, but it usually yields to rest and medical treatment. Further, he would employ surgical aid in cases of perigastritis, adhesion of the stomach to neighbouring parts, and peritoneal abscess, but only when the diagnosis approaches to certainty, and when the inflammatory adhesions form a palpable mass in the abdomen. Finally, it is his opinion that immediate operation is necessary in all cases of perforation of an ulcer into the peritoneal cavity, but he considers that the prospects of success are slight if ten hours have elapsed before it can be undertaken.

At the same Congress the views of a surgeon on the question were expressed in an admirable paper by **Mikulicz.** As might be expected, he goes much further than Leube in recommending operative interference. He believes that operation is indicated in the first place, whenever it can be said that the patient's life is directly or indirectly threatened, as, for example, by repeated hæmorrhages, increasing emaciation, commencing suppuration around the stomach, or where there is a suspicion of carcinoma; and, in the second place, wherever a thorough course of medical treatment has been found to give little or no result and, in consequence of the continued pain, vomiting, and dyspepsia, the patient's capacity for work and enjoyment of life is seriously impaired.

Mikulicz was himself the first man to attempt operation in a case of severe hæmorrhage from a gastric ulcer, which was of frequent occurrence. The ulcer was situated at the pylorus. It was cauterised with the thermo-cautery, and the pylorus which was narrowed was subjected to pyloroplasty. The patient died three days later with some local peritonitis around the stomach. A successful case of cautery of a gastric ulcer, with the performance of gastro-enterostomy for stenosis of the pylorus, was recorded some years ago by **Küster** (*Deutsche med. Woch.*, No. 24, 1894). **Cutler** and **Elliot** (*Boston Med. and Surg. Journ.*, July 15,

1897) record a case of repeated hæmorrhage from a chronic gastric ulcer. The patient was a man aged forty-seven, who had had symptoms of the disease for two years. Elliot operated. There was found to be extensive cicatrisation at the pyloric end of the stomach, and on incising the pylorus it was found to be nearly completely obstructed. The cicatricial tissue in the stomach on the inner surface was rough and friable, and in a very degenerate condition. So large an area was thus affected that it was thought necessary to excise the pylorus and all the diseased tissues, and to take out about one-fifth of the stomach, including the whole of the lesser curvature on the anterior and posterior sides. The patient stood the operation without any shock, and seemed to be doing very well for two days, but he died on the fourth day without any peritonitis and without any definite cause. Cutler, in reviewing the case, regrets that the operation was not attempted at an earlier period, before the patient became so much reduced. He quotes four cases of excision of a gastric ulcer when life was threatened by hæmorrhage, of which three were successful.

Hirsch (quoted in *Medical News*, February 27, 1897) is inclined to favour operation in all cases of hæmorrhage from the stomach, even during the actual bleeding. The difficulty, however, of such a measure must be very great and perhaps insuperable. The seat of an ulcer cannot be indicated before exploration with any certainty, and sometimes even a guess is impossible. But he is hopeful of the results to be obtained from an endoscopic examination of the interior of the stomach through an incision.

There are two points of view from which the operative treatment of a simple non-perforated gastric ulcer may be regarded. Surgical intervention may be considered (1) as a precautionary measure to save life in the kind of case which experience shows is likely to be fatal; (2) as a quicker means of cure than the usual medical method of rest and dieting. As regards the first point of view—that of saving life—it must be remembered that the mortality rate in cases of gastric ulcer under ordinary medical treatment is extremely small, probably not more than 6 or 7 per cent.; Leube's figures, indeed, show a mortality of but little more than 2 per cent. Now in the majority of fatal cases the cause of death is peritonitis from perforation, and it is well known that the cases which perforate are just those in which the symptoms of the ulcer before perforation are of the slightest. Of 276 cases of gastric ulcer consecutively admitted into St. Thomas's Hospital (many other cases being doubtless under treatment as out-patients during the same period of time) twenty-six died. In eighteen of these the cause of death was peritonitis from perforation; in five

others a large sudden fatal hæmorrhage occurred. So that the conclusion is forced on us that the future of the proposed surgical treatment of gastric ulcer as a means of saving life must depend largely on the possibility of accurately recognising beforehand those cases in which a fatal event from perforation or hæmorrhage is likely to occur; and our means of diagnosis hardly extend so far as this at the present time. But there is obviously much to be said in favour of immediate surgical intervention in the class of case indicated by Leube—viz. that in which small and repeated hæmorrhages occur, for this occurrence points strongly both to the depth of the ulcer and to its proximity to a large artery.

In favour of the second point of view, more especially urged by Mikulicz, from which the operative treatment of a gastric ulcer is looked on as a time-saving measure, there is much to be said. The medical treatment is a long affair, often spread over several months. Sometimes after apparent cure only a few months elapse before the patient comes back again with a return of all the symptoms. In such cases, especially those which are resistant to treatment and liable to speedy relapse, it may be by some considered reasonable to fall back on surgical help. And this procedure will have the further advantage that secondary conditions, such as narrowing of the pylorus and interference with the gastric movements by adhesions, may thereby be recognised and relieved by gastro-enterostomy or other means.

2. Surgical treatment of gastric ulcer after perforation.

Numerous cases of successful suturing of a perforated gastric ulcer have recently been recorded. Although it is an undoubted fact that such cases have been known to recover without surgical intervention, so rare an occurrence should not be allowed to influence the decision. **Kirkpatrick**, of Montreal (*Practitioner*, August, 1897) describes a successful case under his care, in which the operation was begun four hours after the onset of symptoms. He notes sixteen other cases taken from various sources, of which nine recovered after operation. The prospect of recovery after operation (apart from the question of the skill of individual surgeons) depends on the time elapsing between perforation and operation, and on the nature and amount of the stomach contents, especially as regards the bacteria present. In Kirkpatrick's case the fluid in the peritoneal cavity was apparently sterile. The result probably depends largely on the varieties of bacteria present. In a case under my care only six hours elapsed between perforation and operation; the ulcer was found on the front wall of the stomach immediately under the line of the abdominal

incision, and the peritoneum was carefully cleansed. Thus everything was favourable for recovery. Yet the patient died two days later of general peritonitis. On the other hand, two successful cases of operation after perforation are recorded by **Hawkins** and **Wallace**, and **Makins** and **Toller** (*Brit. Med. Journ.*, April 10, 1897), which show that an operation should always be attempted even at a late period, provided that the general condition of the patient permits a reasonable hope of success. In one of these cases sixty hours, and in the other twenty-four, elapsed before operation. These two cases are further interesting as showing the severity and varieties of the complications which may ensue after the more immediate danger of death from peritonitis has been removed. The first case developed a large parotid swelling on both sides, a pelvic abscess which discharged into the rectum on the eighteenth day after the operation, and thrombosis of the deep veins of the left leg on the twentieth day. The other patient was seized a week after the operation with sudden dyspnœa suggestive of pulmonary embolism, and this was followed by consolidation of the lower lobe of the left lung. Two successful cases of operation for this condition are related by **Littlewood** (*Lancet*, Nov. 21, 1896). In the first case the operation was performed seven hours after the onset of severe symptoms, but for forty-eight hours previously the patient had suffered from intense pain in the upper part of the abdomen and a feeling of faintness, which probably indicated the beginning of leakage from the ulcer. In this case, as in one previously mentioned, thrombosis of the femoral and popliteal veins, with fever, set in about seventeen days after the operation. In the second case six hours elapsed between perforation and operation. Convalescence was uninterrupted except by the occurrence of severe pain in the left shoulder, which lasted several days, and necessitated the use of morphia. Seven cases are recorded by **Barker** (*Lancet*, Dec. 5, 1896), of which three recovered. They afford good illustrations of the complications which may be looked for, such as subphrenic abscess, pleurisy, and a possible localised basal empyema.

3. Surgical treatment of perforated typhoid ulcer.

Mention was made of this question in "The Year-Book of Treatment" for 1897, and it was then pointed out that in advanced stages of typhoid fever it is by no means easy to recognise the occurrence of perforation with the degree of certainty which the surgeon would desire. It may often be suspected in cases in which subsequent recovery will prove the suspicion to have been unfounded; and, on the other hand, it may be added, cases occur where a patient who has had a distended abdomen for

some time dies without any of the classical signs of peritonitis, and without any sudden alteration of his symptoms, and yet peritonitis from perforation is found at the *post-mortem* examination. Admitting, however, that the diagnosis is not always easy, it may yet be allowed that in many cases the occurrence of perforation can be recognised quickly, and the position of the surgeon in such cases has to be determined. A very useful paper on the subject has been written by **Finney** (*Annals of Surgery*, March, 1897).

It may be taken as fairly certain that nearly all cases of perforation in typhoid fever die, and instances to the contrary are open to doubt. Cases of sudden perforation of the vermiform appendix, and consequent general peritonitis, die with great regularity, unless saved by an early operation. Here the patient has been usually in perfect health up to the onset of peritonitis; but in the case of typhoid fever the patient is commonly already extremely ill, and his very small chance of recovery is thereby greatly diminished. **Finney** has reported and collected forty-five instances of operation in this condition, which he has carefully examined and considers genuine. These show no less than eleven recoveries, a percentage of 26·22. He notes, as an important fact, that in nearly all the cases which proved fatal after operation there was no evidence of any defect in the healing process. From his own experience, he is inclined to place most reliance in the diagnosis of perforation upon the development of an attack of severe continued abdominal pain, coupled with nausea and vomiting, and at the same time a marked increase in the number of white blood corpuscles; and he considers that the rational treatment is by immediate operation, save in patients who are actually moribund. A successful case has been put on record by **Lauder Brunton** and **Bowlby** (*Trans. Med. Chir. Soc.*, 1897). The operation was begun some fifteen hours after perforation. About half a pint of dirty yellow fæcal fluid was evacuated from the lower part of the abdomen. On passing the hand into the cavity amongst the intestines, from which this fluid had escaped, a very indurated coil of bowel could be felt, and after a little trouble this was separated from its adhesions and drawn out of the abdomen. In this section was found a perforation the size of a pea; it was sutured without excision, the sutures being carried clear of the whole Peyer's patch, and extending over a line an inch and a half in length. The operation lasted about forty minutes; there was no collapse at its conclusion, and recovery was uninterrupted.

4. Idiopathic dilatation of the colon.

This form of disease has recently been attracting attention.

Much interest attaches to its causation, but apart from that the condition is one that requires prompt recognition and treatment; and it can hardly be doubted that relief can be best afforded by the surgeon. Under this name are included all cases of extreme dilatation of any part of the colon, where no mechanical obstruction can be found at the *post-mortem* examination.

Hale White (Allbutt's "System of Medicine," vol. iii., 1897) gives a very complete account of the condition, with mention of some twelve cases. He is inclined to exclude from the term "idiopathic dilatation," or "dilatation of unknown origin," those cases of long-standing constipation which end in fæcal impaction, inasmuch as in such cases the mechanism of production of dilatation of the colon is readily intelligible, and he is inclined to limit the use of the term to those cases in which the sigmoid flexure only is dilated. Of this group of pure idiopathic dilatation of the sigmoid flexure he has found six recorded cases. In a man over seventy years of age the sigmoid flexure was found to resemble a dilated stomach, while the rest of the bowel was normal. In a man of fifty the sigmoid flexure was 2 feet in circumference and bent on itself, so as to fill the abdomen. In another man, aged fifty-eight, its circumference was 14 inches. In another it consisted of two large sacs even larger than an ordinary dilated stomach. In a boy aged four and a half the sigmoid formed two huge sacs lying vertically side by side, one in the right half of the abdomen, the other in the left. Taking this sigmoid group alone, Hale White with **Rolleston** and **Haward** consider that the condition may be comparable with the dilatation of the stomach that occurs without obstruction of the pylorus. In another group he places cases which are probably of similar origin, where, as well as the sigmoid flexure, the colon as a whole or in parts is dilated. This condition of the large bowel is one of which the nature and causation will probably only be determined by the observation and comparison of a large number of instances, and the time has not arrived for an attempt at generalisation. But it may well be, that all these cases, including the cases of long-standing constipation ending in fæcal impaction, may eventually be proved to have a simple mechanical cause, and to depend upon some congenital abnormality in the length or arrangement or attachments of the part.

Enemata and purgatives seem from the quoted cases (**Hale White**) to have no effect. The passage of a long rectal tube and puncture of the bowel are alike ineffectual. And there can be little doubt that such cases should be transferred to the surgeon,

and relief afforded either by an artificial anus or by a lateral anastomosis between the ileum and some point low down in the colon.

Martin (*Montreal Med. Journ.*, March, 1897) describes and discusses such a case. The patient was a boy aged three and a half years. After his birth the bowels did not move for five days, but this constipation was overcome by a purgative. During the first part of his life the child was constantly constipated, sometimes for as long a period as eleven days. At the end of the first year gradual and progressive enlargement of the abdomen began, and continued till the end of his life. From time to time the abdominal distension lessened and flatus passed freely, but the bowels were inactive unless purgatives or injections were persisted in. When he came under Martin's observation he was in fairly good condition, but the abdomen was enormously distended, having a girth of 68 cm., with visible peristaltic movements. The abdomen was opened for examination in the median line, and the distended bowel was found to consist of sigmoid flexure, whose diameter was 9 to 10 cm. A second operation was performed a fortnight later, and an incision made in the left inguinal region. But impacted fæces in the colon gave rise to difficulty, and semi-solid fæces were pushed out of the dilated sigmoid flexure. He died six days later from perforative peritonitis. **Osler** had a similar case in a boy aged ten, and here life was prolonged for two years by an opening in the colon. The condition is clearly one of those in which a successful operation will depend largely on its earliness. And it may be noted in this connection that parents are apt to think little of it in their children until the time has arrived at which purgatives and enemata fail. On the other hand, it must be recognised that, as pointed out by Martin, death may be sudden and unexpected. Martin's paper is illustrated by a photograph of his patient, and **Rolleston** and **Haward** (*Trans. Clin. Soc.*, vol. xxix) give a drawing of the appearances seen on opening the abdomen in a case under their care.

At the Clinical Society **Clutton** (*Trans. Clin. Soc.*, vol. xxx.) reported a case of resection of a dilated sigmoid flexure for chronic obstruction. The patient, a woman aged fifty, had suffered as long as she could remember from chronic constipation, and occasionally from sudden attacks of distension of the abdomen accompanied by pain. These symptoms had been much more severe in the last five years, and enemata had lost their efficiency. At the operation a very large dilated sigmoid flexure was found. This was removed, and the two ends of the divided bowel were united by Murphy's button. The operation was perfectly successful, except

for the fact that the button remained in situ. Nearly a year later, however, symptoms of obstruction appeared, due, as was shown at a second operation, to a stricture developed at the line of union.

5. Rupture of the liver.

An interesting case is recorded by **Martin** (*Lancet*, May 8, 1897) in which life was apparently saved after rupture of the liver by abdominal section. The patient was caught between two sets of trucks, and received a severe "rolling crush." The operation was performed about six hours later. At that time temperature was 103°, pulse 130, breathing short and distressed, abdomen hard, tense, and distended, tympanitic in front, dull at the flanks, and evidently containing much free fluid. There was no obliteration of hepatic dulness, and a correct diagnosis was made. The operation was performed in a miner's cottage by the uncertain light of a paraffin lamp. A large quantity of black blood, fluid and clotted, was removed from the abdominal cavity, containing detached portions of liver tissue. A rent, from 1 to 2 inches deep, was found to run from before backwards on the under surface of the right lobe from the portal fissure as far up the posterior surface as could be reached. Hot water was used to arrest the hæmorrhage. The peritoneal cavity was thoroughly cleansed, and a second incision was made above the symphysis, in which a glass tube was placed. He made satisfactory progress, but seven days afterwards developed symptoms of pneumonia, with fever, semi-purulent bloodstained sputum, and distressed rapid respiration. Nine days later this subsided, and the patient made a good recovery.

In some cases of *Glénard's disease* with displacement of the liver, the condition has been rectified by operation. Now that attention has been generally called to this affection, it is astonishing how frequently some degree of it is met with. **Ferrari** (*Supplem. al Policlinico*, Dec. 26, 1896) has freed the liver from adhesions, replaced the organ, and fixed it in position by catgut sutures passing through its substance and through the abdominal wall. In this case the liver was rotated on its transverse axis, so that the upper surface had come to the front; and the patient, a young woman, was in constant pain. Other similar cases have been recorded. I have recently had under my care a woman who had borne eight children. Her stomach, as mapped out by distending it with gas, was somewhat dilated, and the greater part of it lay below the umbilicus. The liver had become displaced downwards, so that it nearly reached the right iliac fossa and at the same time it had been rotated, so that its anterior edge was

now in a nearly vertical position, running from the costal margin towards the pelvis. With all this, her symptoms were slight, and referred merely to the stomach. They were relieved by dieting and diminution in the amount of fluid taken. She was a placid individual; and it is probable that in these cases, as with those of floating kidney, the possession of a neurotic, sensitive temperament plays an important part in the production of severe symptoms.

6. Peritoneal tuberculosis is an affection of which the percentage rate of mortality has greatly diminished in recent years, either through an increased power of resistance in the patients or through an improvement in the method of treatment. The experience of **Bristowe** after long service in the wards and in the *post-mortem* room was to the effect that "it tends, as a rule, to a fatal result; at the same time, there are good grounds for the belief that recovery occasionally ensues." **Fagge** also said that he had seen "several instances in which there was reason to believe that recovery took place, and in one case the diagnosis was afterwards proved to be correct by a *post-mortem* examination." Such pronouncements as these must be considered far too gloomy at the present time. Statistics show that in all probability 50 per cent. recover; and the diagnosis in these cases cannot be questioned, inasmuch as the abdomen is commonly opened as a routine treatment, and the condition of the peritoneum is thus verified. Probably the recognised treatment at the present time in Great Britain may be thus summed up. The patient is placed at complete rest and he is given a generous diet, limited only when there is evidence of much intestinal affection. As regards drugs, in simple cases either tonics are used with or without cod-liver oil, or guaiacol or creasote is administered. Guaiacol carbonate can be given with the syrup of phosphate of iron. If there is much diarrhœa, intestinal disinfectants are used. (Cf. "Year-Book of Treatment" for 1897, p. 85.) When fluid in any amount can be detected with certainty above the symphysis or in the flanks, the abdomen is opened by an incision $1\frac{1}{2}$ or 2 inches long below the umbilicus, and the fluid is removed and expressed. No bactericidal substance is introduced into the abdomen, but if there is much lymph observed, or the fluid is turbid, the peritoneal cavity may be irrigated (so far as that is ever possible) with sterilised water or sterilised normal salt solution. The incision is immediately sutured, and gives rise to no subsequent trouble. I have recently had six cases of tuberculous peritonitis under my care, all of whom left the hospital apparently in perfect health. Five of these were drained dry through a small incision. It has often

been recommended also that the abdomen should be opened and the peritoneum exposed to the air, even when no fluid effusion can be detected. But this practice is probably not very general in Great Britain, so far as can be judged from recorded cases.

Thoma (*Lancet*, Jan. 16, 1897) is a strong advocate of the use of creasote in this condition. "Laparotomy is no doubt the best and quickest of all methods for dealing with those cases in which the peritoneum is covered with miliary tubercles; but it is always a serious operation, and one also which not every medical practitioner is competent to perform. Moreover, the parents of the little patients are usually averse from surgical interference, and anxious for the employment of some other means." These drawbacks to the surgical method of treatment fortunately cannot be said to exist in Great Britain. But if they ever should arise, Thoma's alternative plan of creasote enemata may be remembered. At first each enema contains 150 grm. (about 4 oz.) of emulsified cod-liver oil and 0·5 grm. (8 gr.) of creasote, but after eight or ten days the amount of creasote used may be increased to 1 grm. (15½ gr.). The enema is given daily. After the treatment has been continued for some weeks, he recommends that it should be suspended for an interval of five or six days. He has not noticed that the taste of the creasote is perceived by the children. The appetite is somewhat impaired at first, but it is not lost, and it subsequently improves. He relates two cases which made a good recovery under this treatment.

The apparent benefit which results from opening the peritoneal cavity in tuberculous peritonitis has led **Peterson** (*Med. News*, Aug. 28, 1897) to try its effect on tuberculous mesenteric glands. The benefit derived in tuberculous peritonitis he ascribes to the development of an "increased resistance" of the tissues to the specific bacilli. The explanation that he adopts is that cœliotomy excites an inflammatory reaction of the peritoneum accompanied by an increase in its "resorbing power." Whether this is the true explanation or not, he set himself to determine if this increase in resorbing power would have a favourable effect on underlying tuberculous glands. He has three such cases to record, and for two of them he claims a cure. In one of these successful cases he enucleated four glands from the mesentery, and in the other he merely opened the abdomen and examined the glands. He is of opinion that primary tuberculosis of the mesenteric glands is by no means uncommon, independent of disease of the bowel, and that under favourable conditions beginning tuberculous disease of the glands can be diagnosed, without the presence of palpable tumours, by means of such symptoms as

indefinite abdominal pain and tenderness, nausea, and general malaise.

7. The cold-bath treatment of typhoid fever.

It is still the general practice in British hospitals, and in private practice in England, to reserve the bath treatment in typhoid fever for cases which are attended with a dangerously high temperature. For most cases occasional sponging, with the use of various antipyretic drugs, is the routine treatment. The teaching of **Brand**, however, has taken root in America, and it is probable that England will follow suit. A very clear statement of the results of the routine cold-bath treatment at the Brisbane Hospital for ten years is given by **Hare** (*Med. Record*, May 8, 1897). For five years of the old-fashioned treatment, without the routine use of the bath, the mortality in 1,828 cases was found to be 14·8 per cent. For ten years under the bath treatment the mortality in 1,902 cases was 7·5 per cent. All the fallacies which are inherent in a bare statistical record such as this are fully recognised by the author. He discusses the chances of error from paucity of data, variations in the use of the term typhoid fever, mistakes in diagnosis, differences dependent on age and sex, and variations in the severity of the disease in different places and at different times. His conclusions are probably perfectly fair and just. He adds a table, which distinctly confirms the conclusion that it is this bath treatment, and no other factor, which has so largely altered the rate of mortality. This table shows by analysis that the reduction of the general mortality is owing to reduction in the deaths due to the febrile state and its consequences, while the mortality from perforation and hæmorrhage is but little altered. Thus **Murchison's** mortality rate from perforation was 3 per cent., from hæmorrhage 1·4 per cent., and from other causes—*i.e.* fever and its results on the various tissues and organs—12·8 per cent., while Hare's figures after the bath treatment are, under the same classification, 2·9, 1·2, and 3·4 per cent. respectively. This, by the way, shows a very striking drop from a total general mortality of 17·2 per cent. to one of 7·5 per cent. A paper was read by **Thomley**, at the Medical Society of the County of New York (*Med. Record*, Dec. 28, 1896), in which a series of 250 cases of typhoid fever under the bath treatment, administered in various ways, shows a mortality of 8 per cent. It is not, of course, a strictly scientific comparison, but it may be added that of the last 317 cases treated in St. Thomas's Hospital on the usual plan, without the routine use of baths, the mortality is 17 per cent. The drawbacks to the method, both in private and in hospital practice, are the increased expense due to the

greater number of attendants required and the alarm which its use is apt to excite both in patient and relations. **Osler** (*Johns Hopkins Hospital Reports*, vol. v.), testifies to the value of this method of treatment, and reckons that at least 6 per cent. more lives are saved by it; but he would welcome the discovery of some method which, while to an equal extent life-saving, would be less disagreeable. The easiest plan is to use a bath which can be wheeled to the bedside, the water being at a temperature of 70° F. In this the patient should be placed for fifteen to twenty minutes whenever the rectal temperature reaches 102·5°, and this may be repeated six or eight times in the twenty-four hours if necessary. On removal from the bath the patient is dried gently, no rubbing, of course, being employed over the abdomen; and some stimulant should be given. If there is any collapse, the extremities and thorax should be well rubbed, and hot-water bottles may be applied to the feet. From the wide experience which is now on record, it is clear that there is no danger attaching to the method if it is carried out intelligently. It should, however, be used with caution when, from the intermittence of the pulse, there is evidence of great changes in the muscular substance of the heart, and it should, of course, not be used when hæmorrhage has occurred, or when there is any suspicion of peritonitis.

8. Salol calculi.

The formation of these calculi is the subject of a communication by **Marshall** (*Brit. Med. Journ.*, July 10, 1897), which is important as well as interesting in view of the large use of this drug. The calculus which he had the opportunity of examining was sent to him by Professor Bradbury. The patient, a young lady, had taken a cachet containing 10 gr. of salol once or twice daily for nearly six months. Then attacks of severe colic began, accompanied by vomiting. In one of these attacks the calculus was vomited, and the patient declared that similar bodies had been frequently passed by the bowel. A similar case is quoted from **Brossard**. Here from 4 to 5 grm. (62 to 77 gr.) were given daily, and at the end of ten days the patient, who was habitually constipated, developed severe symptoms of intestinal obstruction. After thirty-six hours of treatment a motion was passed and this, on being searched for a biliary calculus, was found to contain ten crystals of pure salol, weighing altogether 4 grm., the largest weighing 1·8 grm.

In another quoted case (**Girode**) two masses of salol weighing 3 grm. were found in the stomach of a patient who had died from cholera. A correct explanation of this phenomenon of the aggrega-

tion of small quantities of salol into a large calculus is of great importance, and it may be that the usual method of administering the drug by means of cachets will have to be discontinued or modified. Brossard's explanation is that a dose of salol comes in contact with the decomposition products (salicylic acid and phenol) of a previous dose, that under the influence of the phenol the salol becomes liquid, and that when the phenol is replaced by water the salol is converted into a crystalline mass. Marshall's experiments throw doubt on the truth of this explanation. He himself attributes the calculus formation to the varying temperature which is met with in stomach and bowel. The melting-point of salol is a little above the normal temperature of the body (42° C.), and after meals the interior of the stomach may be above this point, so that salol will melt. As the temperature falls recrystallisation occurs. But the result is found to be no longer in the form of minute individual crystals, but solid lumps of coherent crystals are produced, which resist the decomposition on which the beneficial action of the drug depends. His practical recommendation is, therefore, that salol should be given rubbed up with some innocuous powder, or in the form of an emulsion.

9. Treatment of dysentery.

A new drug and the results of its use in dysentery are described by **Maberly** (*Lancet*, Feb. 6, 1897). From his account it appears that this drug has long been known by the old colonists in South Africa as a spirituous vegetable tincture. With difficulty he discovered specimens of the plant, and it was identified as Monsonia ovata of the order Geraniaceæ. With this he made a tincture by maceration in spirit, $2\frac{1}{2}$ oz. to the pint of rectified spirit, which he used in over one hundred consecutive cases of dysentery. He claims a specific action for it. He used it in doses of 3 or 4 dr. at intervals of four hours. Ninety of his cases may be called acute. In none of these acute cases was ipecacuanha used, the treatment consisting of tincture of monsonia in doses of 2 to 4 dr. every four or six hours. In a few instances this was supplemented by a lead and opium pill. The average number of days during which a patient in this class was under treatment was 2·3, which is far below the average given by the statistics of other countries. Ten of his cases were chronic, and of these nine made complete recoveries and were under treatment for 8·1 days on the average. In the remaining case the dysentery was cured, but the constitution was so exhausted by the long illness previous to treatment that the child succumbed to cancrum oris. Seven of the chronic cases recorded as being cured were under observation for periods vary-

ing from one to four years, no relapses occurring. In one case only, so far as the author's knowledge went, did a relapse occur. The plant appears to be common in South Africa. Several species are known to have astringent properties due to their tannic acid. But from the facts that the drug has very little effect in ordinary diarrhœa, and that good results followed the use of only the dried flowering plant (the tannic acid being chiefly in the root), he concludes that it has a specific effect not dependent on its astringent quality. Considering our ignorance of the exact cause of dysentery, and the probability that several forms of the disease exist, it is by no means improbable that a plant having specific qualities may flourish in the dysenteric regions of South Africa; and on the evidence here afforded a more extended trial of the drug is to be desired.

10. Treatment of the summer diarrhœa of young children.

Solis-Cohen (*Med. News*, No. 8, vol. lxix., 1896) emphasises the belief that is now generally held, that "in the majority of cases in which infants or children present symptoms of disturbance of the alimentary canal the local phenomena are those of irritation rather than of structural change, and the systemic phenomena those of intoxication chiefly." In other words, there is little or no true inflammation of the intestinal mucous membrane, and the alarming symptoms, at any rate, are dependent on bacterial action and toxin-formation. He gives the following outline of his mode of treatment. The appearance of vomiting and diarrhœa is by itself a proof that the food is from some cause unfit for the child, and this must be taken to be true, even if the source or nature of the unfitness cannot be discovered. The diet must be changed. The alimentary canal should at once be cleansed of irritating and toxic matters. If this can be accomplished by the administration of a mild laxative, calomel in small doses, or castor oil and aromatic syrup of rhubarb without lavage, it is better to avoid the passage of a stomach tube. If, however, the vomiting is urgent, it is useless to attempt to give an aperient. The stomach should in that case be washed out with a warm (100° F.) solution of sodium borate or sodium bicarbonate, 1 dr. to the pint. At the same time a high enema of warm normal salt solution should be given. The next step is the administration of a powder, in which the author has great faith, consisting of benzo-naphthol and bismuth salicylate, usually in equal parts with or without the addition of Dover's powder. A child of six months can usually swallow 3 gr. of such a powder, and some can take much more. The dose of the first two ingredients is

regulated mainly by the ability of the child to swallow it, but the Dover's powder must, of course, be added in accordance with the rules which govern the use of opium for young children. In some cases it may be necessary to make up a powder containing 5 gr. of the benzo-naphthol and 5 gr. of the bismuth salt, and administer this (perhaps with the addition of a little lactose) in small quantities at frequent intervals, say of ten minutes. The dose for an adult is a powder containing 5 gr. of each of the three ingredients. He insists that it is the combination and not any one constituent that is effective. The intervals between the doses should vary from two to four hours at first, and may be lengthened as the symptoms abate. As regards diet during the treatment, it should consist of barley water in small quantities for two or three days, and all milk should be forbidden. Then freshly prepared meat juice, Pasteurised milk, or even boiled milk may be used, with scrupulous care as to cleanliness. The author is emphatic in declaring against the use of any astringent, such as logwood, kino, or tannic acid, before the alimentary tract has been as far as possible cleansed of irritating poisonous materials. It is no doubt far too common a custom to have recourse to astringents on the first appearance of diarrhœa. In very severe cases with collapse, hot bathing, the external application of heat, and the use of strychnia and alcohol may be necessary. In its broad outlines this plan of Solis Cohen may be taken as presenting the best line of treatment that we have before us at the present time.

In this connection may be mentioned a paper by **Marfan** (*La Méd. Moderne*, June 15, 1897). In the very severe form of choleraic diarrhœa of infants, he is disinclined to wash out the stomach and intestines owing to the possible production of convulsions or collapse. In such cases he confines his attention for the moment to combating the collapse consequent upon the vast drain of fluid from the body. He gives no food or drugs at the extremity of the illness, but administers boiled water at the ordinary temperature, 100 grm. every hour for at least twenty-four hours. He also injects slowly under the skin every five hours from 5 to 20 grm. (according to the age of the child) of a solution consisting of 300 grm. of sterilised (not distilled) water, 2·5 grm. of common salt, and 75 grm. of citrate or benzoate of caffein. In addition warm baths at 35° C. from two to four times in the twenty-four hours may be given, each lasting five or ten minutes.

The use of tannigen in various forms of diarrhœa was mentioned in the "Year-Book of Treatment" for 1897. This

substance is diacetylic tannin, and it appears to have a decidedly beneficial effect in catarrhal states of the bowel arising from any cause. The dose is from 3 to 8 gr., and as much as 35 gr. may be given in a day to an adult. It does not begin to show its astringent effect until it is in an alkaline medium such as is met with low down in the intestine. **Vandenberghe** (*Belg. Méd.*, Dec. 24, 1896) gives a report on its use, and claims for it a great value in many cases of enteritis from various causes. **Comby** (*La Méd. Moderne*, July 28, 1897) has used it with success in the simple diarrhœa of children, and it may be combined in infantile cholera with calomel or some other intestinal antiseptic. In this respect the warning of Solis-Cohen against the hasty use of astringents in this condition, which has been mentioned above, may be recalled with advantage.

11. Artificial food preparations.

The rational use of artificially prepared food forms the subject of a most suggestive paper by **Klemperer** (*Berliner klin. Woch.*, June 28, 1897). This subject, as he says, is a small but important department of practical medicine. As regards albuminous preparations, he points out how the old belief in their great value, as compared with carbohydrate and fatty foods, has altered since the time of Liebig and Voit. When attention was first turned to the possibility of providing invalids with albuminous food, which should be ready for absorption as soon as it was taken into the stomach, the idea was to give it in the form of peptones. Now pure peptone is bitter to the taste, it irritates the stomach and produces vomiting, and it may in large quantities produce diarrhœa. It cannot be used. Then it was recognised that peptone is not necessarily the sole result of gastric digestion, but that a stop is made during the process at the stage of the formation of albumose. So came on the market a number of preparations containing much albumose and little peptone. By the administration of these artificial foods the stomach is no doubt spared much of the work of digestion, but Klemperer questions whether this is often necessary, and whether we do not too often have recourse to them. He thinks that even in conditions of great feebleness there is sufficient hydrochloric acid to ensure conversion of small quantities of albumin. Even when hydrochloric acid is entirely absent, it has been shown by experiment that a sufficient destruction of albumin, with the formation of albumose and peptone, takes place. What the stomach cannot perform is effected in the intestine by the pancreatic secretion and the action of intestinal bacteria. Albumose preparations, then, he allows have nutritive value, but he maintains that they are not necessary.

On the other hand, his point is that every finely divided albumin and every soluble native albumin is just as valuable as the same amount of albumose, and he recommends a soluble albumin or an albumin in the form of a powder as being desirable in all cases with very few exceptions. Such soluble albumin is now to be obtained under the name of "nutrose" and "eucasin," substances which are prepared from the casein of milk. They are found to be well taken by invalids. As regards an albumin in the form of powder, he details how both meat and egg albumin can be completely dried and reduced to this state. Such a powder is easily taken in water or milk, it is easily swallowed, it creates no irritation, and it is quite as valuable as the artificial albumose preparations. Such a preparation will be especially useful in cases of gout, Bright's disease, and a tendency to the excessive formation of uric acid, when the extractives from meat have such a prejudicial influence. "Back to nature" is, in fact, his recommendation. **Oppler** also (*Therap. Monatshefte*, April, 1897) writes of eucasin and nutrose, and he is convinced of their value from his own experience.

12. Acid dyspepsia.

It is important to recognise the very common condition of hyperacidity of the stomach contents, and to treat it on rational lines. **Jaworski** (*Therap. Monatshefte*, September, 1897) gives us a paper with a clear outline of the leading features of the disorder and a recommendation of its treatment with an alkaline effervescing water. In a mild degree the symptoms comprise a feeling of thirst, heartburn, and acid eructations. In more advanced cases there is a feeling of burning about the stomach, which is often intense, with pains radiating into the back, and with vomiting, so that a differential diagnosis from gastric ulcer may be difficult. Often, of course, an ulcer is co-existent with this hyperacidity. There is pathological evidence sufficient to indicate the pyloric region as the seat of the disease. The causes are various. It may be due (1) to organic change in the acid-secreting apparatus, or (2) to fermentative acid-forming processes. As regards the first head, the trouble may make its appearance during the height of digestion, or it may occur with an empty stomach, or it may be continuous. And in the author's opinion all these forms should be regarded as different stages of one continuous anatomical process, of one continuous over-secretion of hydrochloric acid, probably dependent on hyperæmia of the secreting surface. As **Sir William Roberts** puts it, acid dyspepsia may to a certain extent be regarded as an ill-directed vigour of digestive action. And it is certainly very common in strong and

otherwise healthy individuals. On the other hand, the fermentative variety of hyperacidity depends on the production of acetic and lactic acids. Acetic acid is accompanied by more intense pain than is lactic acid. Now a rational treatment of all such cases comprises attempts to hinder the formation of the excess of acid and to remove the anatomical changes in the mucous membrane of the stomach. Obviously the first point is the neutralising of the acid, on which the subjective symptoms of discomfort apparently depend. Although the exact effect of alkalies on the gastric secretion is still a matter of dispute, the broad clinical fact remains that, by neutralising the stomach contents, not only are the subjective symptoms for the time thereby removed but, by a long continued course of such treatment, an apparently normal process of digestion can be induced. **Jaworski**, after long experience, is convinced that the best method of attaining the necessary neutralisation is by the administration of an alkaline water. For simple neutralisation he uses bicarbonate of soda, and in order to check fermentation he makes the addition of the sodium salts of salicylic and boric acids. He uses his alkaline water in two strengths, both being impregnated with carbonic acid gas. The first contains 8 grm. of bicarbonate of soda, 2·5 of sodium salicylate, and 2·0 of sodium biborate, in a litre of water. The second contains 5, 2, and 1 grm. of the same salts respectively, in the same amount of water. Of the stronger water he gives half a tumbler on an empty stomach, early in the morning; of the weaker a third or half a tumbler after every meal. When fermentative processes are predominant, the stronger water may be given more frequently. He notices that the thirst which these patients experience is relieved with smaller quantities of this solution than of ordinary water. The heartburn and gastric oppression and pain are relieved. In cases where the hyperacidity reaches its maximum during digestion, and in pure cases of continuous hypersecretion (hyperchlorhydia) the subjective symptoms markedly diminish when the water is taken in doses of half or a whole tumbler half an hour or one hour after a meal.

Bergmann has suggested a plan with the same view of neutralising an excess of hydrochloric acid, which is simple and may be efficacious in the milder forms of the condition. He bases his suggestion on the fact that the saliva which is swallowed naturally tends to neutralise the gastric acid without irritating the gastric mucous membrane. In this condition of hyperacidity, however, the saliva loses much of its alkalinity, or even itself becomes acid. He recommends, therefore, that such patients should chew during the process of digestion tabloids composed of ammonio-

phosphate of magnesia and calcined magnesia. The saliva is thereby rendered strongly alkaline and exerts a considerable neutralising effect in the stomach. By this plan there is avoided the risk of exciting the stomach to a still greater secretion of acid, which he considers may be the case when alkaline drugs are directly introduced into the stomach. His plan is, in fact, an attempt to imitate and increase a natural process; inasmuch, however, as the mouth is often unnaturally dry in this condition, he adds to the tabloids small doses of ginger and of calamus-root, an extract of which finds a place in the pharmacopœia of the United States. A large secretion of alkaline saliva is thus produced. **Wagner** (*Therap. Monatshefte*, May, 1897) has tried this plan, and records several cases in which it was apparently highly beneficial.

The thought must often occur to us as to the possible danger of eventually doing harm by the long continued use of antacids as neutralising agents in this condition of acid dyspepsia. Many a patient having experienced relief from a dose of bicarbonate of soda, continues to use it indefinitely at his own free will. The experience of **Sir William Roberts** is comforting on this point. He is satisfied (*Digestion and Diet*, 1897) that with due precautions the practice is harmless. Of all drugs he prefers the bismuth lozenge of the British pharmacopœia, and he regulates the use of it in this way. They are not to be used at or near meal times, in fact, not sooner than three-quarters of an hour, or an hour, after breakfast, nor sooner than an hour or an hour and a half after dinner. They are not to be used regularly and systematically, but only when the discomfort arising from hyperacidity is more than a man can be reasonably expected to bear when he has an easy means of relief ready to his hands. The bismuth lozenge (preferably without the bismuth) he considers a valuable remedy; its value lies in the carbonates of magnesium and calcium. He also, like Bergmann, is in favour of lowering the acidity of the stomach contents by exciting a copious flow of saliva; and he recommends, as a valuable addition to the resources of the dyspeptic, the sucking or chewing of a gum lozenge, a glycerine jujube (if the sugar contained is no bar to its use), or even a "tear" of gum arabic. He has obtained good results from this simple treatment, and he thinks that the gummy solution as it arrives in the stomach has a local soothing effect. Of course, in severe cases some form of alkali must also be administered.

DISEASES OF THE KIDNEYS, DIABETES, ETC.

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I.—SYNOPSIS.

During the year that is past a considerable number of papers has been contributed to the literature of urinary and renal therapeutics, and some brilliant results have been got by different observers in the treatment of toxæmias by lavage of the blood. The method promises well in the treatment of uræmia, and is worthy of a wider trial. There is not much that is new in the literature of nephritis. Band contributes an interesting paper on the value of tube casts in prognosis in nephritis, and further experiences are given of lactate of strontium. In the section of diabetes is a paper by Lépine on his further experience of alkaline injections in the treatment of diabetic coma, and several papers are contributed on the question of diet in diabetes, amongst which will be found a timely protest on the too rigorous dieting of the diabetic. Several articles of interest have been published during the year on renal pain, its varieties and treatment. The serum treatment of disease has been applied to urinary infection through the bacillus coli communis, and seems to promise well in some cases. The use of urea as a diuretic is advised by Klemperer, but the results of other observers do not support his contention. The usual elaboration of urinary tests will be found.

II.—NEPHRITIS, ETC.

1. The importance of tube casts in prognosis in nephritis.

Band (*Lyon Médical*, No. 41, Oct. 11, 1896) lays special stress on the importance of tube casts in cases of albuminuria, enabling the observer to distinguish between an epithelial nephritis and other renal lesions, interstitial, arterial, and cardiac, etc. The *simple* presence or absence of casts is alone of little importance

from a prognostic point of view, but the study of casts has a special significance, which nothing else supplies, in the diagnosis of epithelial nephritis, and the appreciation of the inflammatory process in the affection.

The presence of granular casts shows an active inflammatory process going on in the epithelial cells. Granular casts show many varieties, their appearance varying with the intensity of the inflammation. When the inflammatory process is very active, the proliferation and destruction of epithelial cells are very rapid, and granular *débris* is abundant; the resulting casts are then consistent and opaque. When the inflammation diminishes, the granules are clearer and less numerous, lose their confluent appearance, and are scattered in an amorphous hyaline *débris*. The casts are clear and more or less transparent. In both cases, but especially in the second, detached cells are present in the cast—cells not yet completely destroyed. The diameter of the casts varies with the diameter of the tubes from which they are derived, and is the larger the more intense, and especially the more long-standing, the inflammation.

Epithelial casts, properly so called, are those which consist of a mosaic of epithelial cells, and are not so frequently found in epithelial nephritis. They belong more to the degenerative lesions. Their significance is not so precise as that of the granular casts, but, as a rule, they indicate a more simple inflammation. When albuminuria persists after an epithelial nephritis, the absence of casts on several consecutive examinations shows that all epithelial inflammation is gone, and that the albuminuria is cicatricial. On the contrary, the abundance, opacity, consistence, and size of the casts show that the inflammation is active, and that the diminution of the clinical symptoms is deceptive. The presence of granular casts, clear, transparent, and of small diameter, points to a less active process, non-progressive, but not completely abolished. Repeated and regular examination of the urine is necessary, as giving a just appreciation of the progress of the case.

2. The use of mercury in nephritis.

Campbell Black (*Scottish Medical and Surgical Journ.*, vol. i., No. 5), in a paper on the pathology and treatment of nephritis, advises the use of perchloride of mercury. He considers mercury an antiphlogistic agent of supreme efficacy. The mercury should be combined with iodide of potassium, so as to form a biniodide, and thus keep the drug in solution. In addition to the administration of mercury, the author advises that diluents be reduced to a minimum, and that solid food be given. Fourteen

cases of nephritis are quoted to illustrate the advantage of the treatment.

[With the restriction of diluents in cases of nephritis few physicians will agree, and the recent success of the treatment of uræmia by "washing the blood" would support the view that diluents, far from being noxious, are of advantage in cases of nephritis, especially if any tendency to uræmia be present. The use of mercury in nephritis must still be considered a vexed question. **Pepper** (*Medical News*, No. 24) advocates the use of calomel as a diuretic in some cases of renal disease. **Welander** (*Archiv für Dermatologie und Syphilis*, vol. xxxvii., No. 3) has published an exhaustive study of the effects of mercury on the kidney in syphilis. He finds that mercury, especially when it is pushed, causes cylindruria, and at times albuminuria, more or less severe according to the idiosyncrasy of the patient. In nephritis of syphilitic origin, mercury must be given cautiously, as the drug is at times eliminated abundantly through the kidneys, and toxic effects may easily be produced where the kidneys are damaged.]

3. Strontium lactate in nephritis.

Pick (*Prager med. Wochenschr.*, No. 39, 1896) records over forty cases of different forms of nephritis treated with strontium lactate. The remedy was well borne, in only one case was there vomiting, and the strontium lactate was not retained. There were no unpleasant secondary effects noticeable from the drug, with the exception of a peculiar skin affection which was noted in one case. As far as the therapeutic effect was concerned, in interstitial nephritis and in conditions where a large amount of urine with a small proportion of solids was being excreted, no beneficial effect was noticeable from the drug. In acute nephritis it was difficult to estimate any benefit obtained, for such cases undergo improvement by rest in bed, equable temperature, and bland diet, so that the influence of the drug could not be properly appreciated. It must be admitted, however, the author considers, that where the remedy was administered over a prolonged time, there was a decided diminution not only in the percentage amount of albumin, but also in the total.

An increased diuresis was noticeable in a certain number of cases, and in many a decided increase of appetite and subjective betterment. The drug, the author concludes, is one with decided diuretic and hygienic usefulness, and in certain cases of parenchymatous nephritis diminishes the albumin, relieves the œdema, and produces a subjective feeling of betterment.

[There is now considerable evidence in favour of the use of

strontium lactate in nephritis where a diuretic effect is desired (see "Year-Book," 1897, p. 102). The drug is best given in watery solution.]

4. To test the activity of the kidneys.

Achard and **Castaigne** (*Gazette Hebdomadaire*, No. 37, 1897) advise the use of subcutaneous injections of a solution of methyl blue to test the activity of the kidneys. The methyl blue being excreted by the kidneys gives to the urine a blue or greenish-blue colour, the length of time required for the colour to appear in the urine gives an indication of the rapidity and efficiency of the kidney excretion. By introducing the colouring matter under the skin, any error through the differing rate of absorption by the stomach is eliminated. The methyl blue is used in a 1 in 20 solution, and 1 c.cm. of this is injected. The substance is innocuous. After the injection the patient should urinate every quarter of an hour. It is only in cases of extreme polyuria that the dilution of the blue is so great as to vitiate results. In healthy persons the colour appears in the urine a quarter of an hour after injection, and reaches its height during the third or fourth hour. All colour is gone from the urine in from thirty-five to fifty hours. In individuals where the kidneys are diseased, the appearance of the colour is retarded. It is absent during the first hour, and does not appear for three hours or longer, and in some cases is excreted so slowly as never to give an appreciable colour to the urine. Thus in interstitial nephritis the colour appeared very slowly, and persisted for six days after the injection. The authors find from their observations that when elimination of the pigment begins within the hour, the kidneys may be considered as possessing normal permeability, even though, as in some cases quoted, albumin is present in the urine.

5. The use of artificial serum in kidney disease

Bovet and **Huchard** (*Bulletin Général de Thérap.*, vol. cxxxii., Jan. 30, 1897), in an interesting paper, review the literature of the employment of subcutaneous injections in toxæmia, and quote an illustrative case of septic pyo-nephritis. The condition had lasted for some months, and the patient showed all the symptoms of general toxæmia. The urine was scanty and contained pus, albumin, and tube casts. There was nightly fever. The pulse was rapid and the tongue dry. Exhaustion and delirium set in, and the gravity of the condition was increasing when the injections were begun. Under treatment by injections, amelioration of the symptoms took place, when the injections were pushed to 1,700 to 2,000 grammes daily during nearly a week. The amount of urine excreted rose in proportion to the amount of the injection.

The amount of albumin in the urine fell under the treatment from 3 grammes to 0·1 gramme. The clinical phenomena showed a continuous improvement after the injections. From being in an apparently hopeless condition the patient became quite convalescent. In the course of the treatment the patient received 16 litres of fluid subcutaneously and 14 litres by enema. The fluid used contained sodium chloride in the proportion of seven parts per thousand. The absorption of 2,000 c.cm. of this fluid was completed in about an hour. The authors conclude that the injection of 2,000 c.c. of saline fluid into the cellular tissue is accompanied by no danger, while the same cannot be said if it be injected directly into a vein. As the result of the injections marked diuresis occurs. Usually, as the injection is given, the patient shows signs of improvement, but within half an hour a rigor sets in with rapid pulse, followed in half an hour with great flushing of the skin, then profuse sweating and increased urinary excretion. There may be marked febrile movement.

Solé (*La Presse Médicale Belge*, Jan. 24, 1897) contributes a paper on the use of subcutaneous injections in eclampsia, and advises the treatment in all cases of toxæmia. The case of a married woman is recounted who when pregnant was attacked with pains, nausea, vomiting and headache. She was semi-comatose. The urine was scanty, contained blood and an enormous amount of albumin. The coma deepened and convulsions supervened. Artificial delivery was carried out, but two days afterwards, the coma still persisting and the general condition deteriorating, normal saline solution was injected into the subcutaneous tissue of the axilla on each side. This was immediately followed by increased secretion of urine. The injections were repeated in different parts every four hours, and at the end of twenty-four hours the patient's condition was very much improved and recovery took place. **Hare** (*Therap. Gazette*, No. 4, April 15, 1897) records two cases of toxæmia treated by injection. The first, an old man, developed acute toxæmia with high fever and coma as the result of spreading gangrene of the leg. The result of the injection was to rouse him out of his coma; but he ultimately died. The second was a patient with chronic parenchymatous nephritis who developed uræmia. As the patient was too ill to be bled, or purged, or to receive pilocarpine, the injection of hot saline solution was tried. The following day his uræmic symptoms had disappeared, and the dropsy had not increased. Ten days later, as the uræmic condition seemed to be returning, the injection was repeated with good effect. These results are in line with a case of eclampsia formerly reported by **Proben**, where recovery took

place under saline injections when the patient seemed in a hopeless condition. **Richardière** (*Union Médicale*, Dec. 6, 1895) has also used injections of artificial serum in uræmia. In his cases the patient was bled preparatory to injecting the fluid. Both the cases made a good recovery. **Michard** (*Le Progrès Médical*, No. 2, 1896) used injections in fifteen cases of septic peritonitis along with the usual surgical means of treatment. Of the fifteen cases five recovered.

[The best fluid for injection seems to be a modification of Ringer's fluid as advised by **Edes** (*Boston Medical and Surgical Journ.*, March 4, 1897). It consists of—

Calcium Chloride	0·1 gramme.
Potassium Chloride	0·75 „
Normal Salt Solution	1·000 c.cm.

(·75 per cent. solution.)

The fluid should be injected slowly into the cellular tissue, not into a vein.

Absorption from the cellular tissues is very rapid, and the injection is not accompanied with the same danger as in direct injection into a vein. Preliminary bleeding, as advised by Richardière, is quite unnecessary. The method is worthy of a wide trial in toxæmia and especially in uræmia, and seems to offer a chance of recovery to many almost inevitably fatal cases.]

6. Ether in uræmic dyspnœa.

Gallois (*Thèse de Lille*, 1897) discusses the treatment of uræmic dyspnœa and advocates the use of ether, which, being rapidly eliminated, can be given in fairly large doses without danger of intoxication. In uræmia with dyspnœa, ether may be given hypodermically in ½-drachm doses night and day as well as by the mouth in dessertspoonful doses. Under large doses of ether improvement in the respiration takes place, and the feeling of suffocation disappears. A diuretic effect was also noted. The treatment should be continued for several days, the dose of the drug being gradually diminished, and the interval between the doses increased. The author emphasises the point that the drug must be pushed, two to three ounces being given in twenty-four hours before good results can be expected. Though subcutaneous injection is painful, the rapidity of absorption is a point of importance: the injections must be given deeply into the muscles to avoid irritation of the skin. The drug exerts no injurious effects upon the kidneys, nor does it aggravate any existing lesion.

7. Alimentary albumosuria.

Chvostek and **Stromayer** (*Wiener klin. Wochenschr.*, 1896, No. 47),

discuss the question of alimentary albumosuria first described by Maixner in ulcerating carcinoma of the alimentary canal. When an ulcerating surface is present in the alimentary canal albumose may be absorbed directly into the circulation without being reconverted into albumin in the intestinal wall. The albumose is then found in the urine. The authors record six cases of tuberculosis, where the symptoms pointed to an implication of the alimentary canal, but in which ulceration of the bowel could not be diagnosed with certainty. Peptone, or somatose in solution or in the form of a thin soup, was administered, and in a few hours albumose could be demonstrated in the urine. In every case ulceration of the bowel was found *post mortem*. A series of twenty cases without any intestinal affection were given peptone as a control experiment, and no albumosuria occurred. In the case of three patients where ulceration of the bowel was found *post mortem*, albumosuria could not be produced. The authors conclude that while the production of alimentary albumosuria is proof of intestinal ulceration, a negative result does not exclude the presence of ulceration.

III.—DIABETES.

8. The initial stages of diabetes mellitus.

Loeb (*Centr. für innere Medicin*, No. 5, 1897) in a previous paper (*Centr. für innere Medicin*, Nov., 1896) advanced the view that, in many cases of diabetes, long before the disease definitely manifested itself by marked glycosuria or other symptoms, the excretion of sugar could be demonstrated in the urine. He now brings forward an additional case in support of his contention. The patient, a man 55 years of age, sought advice on account of loss of smell, which had existed for two years. In other respects he seemed in perfect health. Nothing local could be found to account for the loss of smell, but a decided sugar reaction was obtained in the urine. With a specific gravity of 1,018 the urine contained 0·25 per cent. sugar. There was no complaint of thirst or exhaustion, nor of emaciation, the patient being well nourished. A year afterwards, the patient, though still in good health, complained of cramps in the legs, most severe in the early morning. He drank more fluid and passed more water than formerly, having to rise twice, as a rule, during the night. The urine contained 3·5 per cent. sugar. Had the patient not consulted a medical man while still apparently in perfect health, the early occurrence of sugar in the urine could not have been noticed.

The occurrence of cramps in the legs in the case quoted is of interest. Cramp in the legs as an early symptom of diabetes seems first to have been noted by Unschuld of Neuenahr.

9. The treatment of diabetic coma.

Lépine in 1887 recorded cases of diabetic coma treated by the intravenous injection of large quantities of saline solution. Returning to the question (*La Semaine Médicale*, xvii., 1897), he gives his further observations, and records the case of a patient treated in this way. A young man, 24 years old, had suffered from diabetes, subsequent to a fall. When admitted to hospital, it was found that on a diabetic diet he was excreting 9 to 10 litres of non-albuminous urine, with an average of 48 to 55 grm. of sugar. The patient was not much emaciated, but was very weak from nightly fever consequent upon a tuberculous affection of the lung. The urine gave a marked red reaction with iron perchloride. On December 30, 1896, unusual amplitude of the respiratory movements was noted—a symptom which Lépine regards as of very grave significance; 25 grm. of bicarbonate of soda was ordered during the day. By ten o'clock next day the patient had become completely comatose, the breath smelt of acetone, and the pulse was very weak. A solution containing 7 grm. sodium chloride and 10 grm. sodium bicarbonate per litre was prepared, and two litres at a temperature of 100·4° F. were injected into a vein, the whole bulk of fluid being introduced in less than a quarter of an hour. During the injection the pulse became stronger, and the respirations less exaggerated, and by the time it was completed the patient had regained consciousness. Though the patient rallied considerably, he passed but little urine, which had a strongly acid reaction. At night the patient became comatose again, and died. The author ascribes the benefit obtained to the fluid neutralising organic acids in the blood, and expresses great hopes of the treatment in more favourable cases, and when used before coma has been completely established. In the *Lyon Médical*, No. 15, 1897, Lépine records two cases. The first patient seemed in imminent danger of passing into coma. A subcutaneous injection of two litres of the saline fluid was given, but without marked amelioration. The patient was removed from hospital, so the further history of the case could not be obtained. The second case, a man of thirty-seven, was passing in twenty-four hours ten to twelve litres of urine, containing about 700 grm. of sugar. Under treatment he improved, but on being allowed some liberty in diet, the disease grew worse, and the respirations became laboured. Two litres of saline fluid were injected into a vein. After injection there was decided diuresis,

and the amount of acetone and oxybutyric acid was trebled, showing an increased excretion of the toxic substances constantly present in diabetic coma. The patient made a good recovery.

[Lépine's results are encouraging, and agree with those of Rogue, Devie, and Hugounenq. Lépine considers that the fluid should be injected directly into a vein instead of into the cellular tissue, when phlegmonous inflammation may supervene. Intravenous injection he considers entirely free from danger, a conclusion with which few observers will entirely agree. Indeed, **Mourette** (*Thèse de Paris*, No. 40, 1896-7) records two fatal cases after intravenous injection, while no fatality has been noted after subcutaneous injection. Injections into the cellular tissue are more easily carried out, are entirely free from immediate danger, the fluid is very rapidly absorbed, and if the injection be performed with the care which should, at the present day, be accorded to every surgical operation, however trivial, there should be but little or no danger of phlegmonous inflammation.]

10. Diet in diabetes.

Pfaff (*Boston Medical and Surgical Jour.*, 1896, p. 234) advocates the treatment of diabetes by rest and exercise of the diseased cells of the organism. He points out that Cantani was the first to recognise the importance not only of a qualitative, but also of a quantitative restriction of the diet—a qualitative restriction in the way of carbohydrates and a quantitative restriction as regards proteids. These views have been elaborated by Naunyn with the view of strengthening the diseased cells by giving them rest by withholding carbohydrates and permitting but a limited use of proteids for a period, after which, according to the individual necessities of the case, the amount of food is increased and the quality varied.

The treatment begins with a course of "severe diet." Five hundred grammes of lean meat of any description, except liver, is given per diem. The meat is weighed after boiling. In the preparation of the meat only oil, butter, vinegar, or lemon are used. As well as the meat three litres of liquid are permitted—water, meat broth, soda water, etc., along with a little brandy. This diet is kept up for 14 days, and according to the results obtained by this treatment and the subsequent alteration in the diet by the addition of carbohydrates, cases of diabetes are divided into three classes—severe, moderate, and slight. If after the trial treatment sugar remain present in the urine in quantities exceeding 1 per cent. the case is severe. If the sugar disappear, three ounces of bread are added to the diet, and if the urine remain sugar-free the case is considered slight. If sugar appears after the addition of

bread to the diet, the case is put in the second class—the class of moderate severity. The ultimate treatment consists in the careful regulation of the diet, so that the strength is kept up and the body-weight not diminished and the sugar excretion kept down. In the first week of the treatment the patients (as might be expected) lose a few pounds in weight. In increasing the diet proteids must at first be used, unless dyspeptic symptoms be set up from excessive meat diet; afterwards vegetables, bread, and milk in small quantities are added. In severe and moderate cases it is impossible to keep the urine sugar-free, but it can be done in slight cases. Fat should be added to the proteid as early as possible. It is best given in the form of cream, which is better borne than fat meat, lard, or butter. If the cream be diluted with weak tea or coffee, a pint a day can easily be taken. Moderate exercise and baths are beneficial, for, as has been shown, exercise increases the power of the diabetic in the consumption of sugar. During the period of "severe diet" codeia will be found useful in soothing the patient and rendering the diet more easily borne.

11. Milk diet and diabetes.

Oettinger (*La Semaine Médicale*, No. 8, 1897) discusses the question of the use of milk diet in diabetes. If milk is to be avoided, it is on account of its containing lactose, cow's milk containing 50 grammes per litre. Milk sugar in the alimentary canal under the influence of the invertive ferment is not broken up like glucose into inverted sugar, but its ultimate transformation into glucose does not appear to be a matter of doubt. **Bouchard**, indeed, found that if a diabetic on a fixed diet be given a litre of milk in addition to his diet in twenty-four hours an increased excretion of 50 grammes of sugar takes place. **Donkin**, on the other hand, disagrees with this observation and advises milk in the treatment of diabetes. Oettinger tried milk in a series of cases of diabetes. The first was a man 55 years of age, who had previously suffered from nephritis with œdema and uræmic symptoms. In 1896 he began to suffer from polyuria and polydipsia, and the urine was found to contain a large amount of sugar. On account of the former attack of nephritis, the low proportion of urea in the urine, and the presence of marked œdema, he was put upon an exclusively milk diet. No other medication was given. Five days afterwards all trace of sugar had disappeared from the urine, and the quantity of urine fell from five litres per diem to two. At the same time the œdema disappeared. The sugar continued absent from the urine for eight days, then the patient, disgusted with milk, and complaining much of lassitude, returned to an ordinary diet. The sugar immediately returned

and increased in quantity, and the amount of the urine rose. A diet was then tried consisting of 1,500 grammes' milk with eggs, meat, and legumes, and the sugar rapidly diminished again, and the general health improved. A second case was that of a gouty patient with diabetes and albuminuria who was put on milk diet on account of dyspepsia. A remarkable diminution in the sugar excretion took place. A third patient suffered from diabetes and nephritis with œdema. An exclusively milk diet in no way increased the sugar excretion, and the general symptoms were considerably ameliorated. From purely clinical evidence the author concludes that milk is by no means hurtful in diabetes, and that milk sugar is not in *all* diabetics a generator of glucose.

[The views of Oettinger are supported by Charrin and Guillement (*La Semaine Médicale*, 1896), who found that the administration of milk along with a diabetic diet rendered the diabetic food more easily supported, and did not increase the sugar excretion to any appreciable extent. **Klemperer** (*Therap. Monatshefte*, vol. x.) considers that in severe cases of diabetes milk is a necessary and staple article of diet, and may be given in quantities up to two litres per diem.]

12. Treatment of diabetes mellitus.

Munson (*Journ. of the Amer. Med. Assoc.*, Chicago, May 15, 1897) advocates the necessity of permitting the use of a certain amount of carbohydrate food in diabetes. He considers that the diabetic should be under the same diet conditions as the healthy individual, and that the rigid exclusion of carbohydrates is productive of abnormal metabolic changes, which result in progressive emaciation and weakness, and in the production of various toxic bodies to which the severe cerebral symptoms of the disease are attributable. He argues that sugar is always present in the blood and cannot be made to disappear by exclusion of carbohydrates as the systemic and ingested albumins are capable of furnishing sugar by their decomposition. The increased decomposition of albumin resulting from a purely nitrogenous diet causes increased metabolism and consequent loss of body-weight. The administration of carbohydrates retards metabolism. The diabetic has not lost the power of oxidising sugar, which must be given even more than in health, to prevent loss of weight and muscular weakness. The abnormal metabolism of albumin, which is especially produced by a rigid proteid diet, results in the production of toxic bodies, while the administration of carbohydrate prevents or retards the production of these bodies.

The accepted treatment of diabetes has essentially consisted in placing the patient on a diet from which all carbohydrates are

excluded, with the sole object of causing the disappearance of the sugar from the urine. This treatment, Munson considers, is based upon the false hypothesis that the presence of sugar in the urine constitutes the disease and if it can be made to disappear the affection is cured. But the glycosuria is merely a symptom resulting from intricate morbid processes. To treat the sugar cannot cure the diabetes, and is merely symptomatic treatment. A healthy individual cannot maintain health on a purely proteid diet, much less a diabetic. The dangerous cerebral symptoms, the great body waste, and consequent emaciation resulting from a purely proteid diet, are of more importance than the excretion of unoxidised sugar, which in the author's opinion has little pathological and no prognostic significance. The diabetic should live upon a diet which keeps his body metabolism at its lowest, and for this carbohydrates are necessary. There is no cure for diabetes, and treatment must be directed to prolong life, which a rigid proteid diet is not calculated to do.

[Munson's paper is interesting, and is a timely protest against the too rigorous proteid diet which may result in an attack of coma. The views advanced seem to be somewhat extreme, and the right path will probably be found in a middle course which permits the diabetic sufficient carbohydrate to satisfy the necessary calls of the organism and keep the body-weight up, but eliminates all unnecessary carbohydrates from the food.]

13. Uranium nitrate in diabetes.

Burton (*Brit. Med. Journ.*, i., 1894, p. 847) reports a case of diabetes treated by uranium nitrate. The patient, a lad aged seventeen, had suffered for a year from thirst and polyuria, with emaciation and weakness. He had cramp-like pains in his lower limbs, both knee-jerks were absent, and there was some tenderness on pressure in the legs. When first seen he was passing 10 pints of urine per diem, of a specific gravity of 1040, containing acetone, a trace of albumin, and 38 gr. of sugar per oz., the average daily excretion amounting to 7,600 gr. Rigorous diabetic diet was ordered, and by the end of a week the sugar had but slightly diminished. Uranium nitrate was then ordered in gr. doses, thrice daily. The dose was gradually increased till after three weeks the patient was taking 6 gr. thrice daily. Some improvement was noticeable, the average daily excretion of sugar having fallen to 2,400 gr., the amount of urine to 5 pints, while the patient's weight had increased. The dosage of the drug was pushed up to 12 gr. thrice daily, gradual improvement taking place. There was passing disturbance of digestion, but the body-weight increased and the sugar excretion remained at an average

of 2,000 gr. per diem. The drug seemed to have no effect on the amount of albumin and acetone in the urine. While under treatment the patient gained 7 lb., and the daily excretion of sugar and urine was reduced from 10 pints and 7,600 gr. to 3½ pints and 2,170 gr. respectively.

Duncan (*Brit. Med. Journ.*, Oct., 1897) considers that the treatment of diabetes by uranium nitrate merits further trial. He records five cases in which the drug was employed, and formed the opinion that the diminution in the amount of urine and sugar and the improvement in the weight and in the general health and strength were due to the stimulating effect of the uranium salt upon the sugar-consuming cells of the organism.

[Since the publication of **West's** paper in 1893 a number of careful observers have used uranium nitrate in diabetes. Some, such as Duncan and Burton above quoted, have got good results, but in the hands of others, such as Saundby and Tyson, little or no benefit has resulted from its use. The drug cannot be regarded as by any means a specific, but in a certain number of cases it seems to do good.]

14. Antipyrin in diabetes.

Jobin (*Monats. ueber die Harn- und Sexual-Apparatus*, vol. ii., No. 1, 1897) advocates the use of antipyrin in diabetes mellitus. **Moussé** (*Semaine Médicale*, 1896), however, finds that the drug causes merely a fleeting diminution in the amount of sugar, uric acid, and urea, and concludes that it should not be prescribed in diabetes. As **Coolet** has shown, antipyrin exerts an undoubted influence on phlorizin glycosuria, but little or no conclusion can be drawn from such experimental results, as many drugs which have an undoubted influence on the sugar excretion in diabetes have no influence upon phlorizin glycosuria. Former observers have found antipyrin of benefit in diabetes by diminishing the polyuria. Thus a dose of antipyrin at bedtime may enable the patient to sleep without having to rise so frequently during the night.

15. Sparkling wine in diabetes mellitus.

Teschemacher (*Münchener med. Woch.*, No. 10, 1897) discusses the question of the use of sparkling wine in diabetes. In his observations half a bottle or more of dry champagne was added to the daily diet and no increase in the sugar excretion was noticeable. From the results he concludes that good sparkling wine (best, he thinks, "made in Germany"), even in large quantities, has no deleterious effect on the sugar excretion in diabetes.

The results agree with an observation of Ebstein, who notes

the case of a diabetic who daily consumed large quantities of champagne without any evil results.

16. "Bronze diabetes."

Jeanselme (*Société Méd. des Hôpitaux*, February 5, 1897) describes two cases of the so-called "bronze diabetes." In the first case the diabetes was ascribed to intoxication, in the second to trauma. In the blood of neither could pigment be demonstrated, but it was present in all the secreting organs in both cases, and there was marked increase of interstitial tissue in the liver and pancreas. The disease, he considers, begins with a destruction of red blood corpuscles. Pigment is thus set free, and is deposited in the various organs, and a consequent sclerosis takes place. The diabetes he considers to be secondary to this sclerosis in the liver and pancreas.

[Jeanselme's views agree with those of Moosé and other observers in considering that the pigment results from altered hæmoglobin. Hanot and Chauffard, who originally described the condition, considered the cirrhosis to be the result of the diabetes and not the cause.]

17. Pentosuria and xanthoma diabeticorum.

Colombini (*Monatshefte für praktische Dermat.*, No. 3, 1897) describes an interesting case of xanthoma with the occurrence of pentose in the urine. The patient, a peasant fifty years old, consulted the author on account of an eruption which had appeared on the legs, buttocks, loins, and arms. The eruption had been present for about 160 days, and since its appearance the patient who had formerly been in perfect health, found that his strength had deteriorated, and that he was unable to work. On examination, the eruption showed the characteristic appearance of xanthoma diabeticorum, but when the urine was examined, to the author's surprise, it did not give the ordinary sugar reactions. It was found that the patient was passing between 650 and 920 c.cm. urine in the twenty-four hours with a specific gravity of 1023 to 1025, of a reddish golden colour, slightly acid in reaction, and containing neither albumin, propeptone, nor peptone. There was a doubtful reduction of Fehling's solution which appeared on cooling, and grew stronger on standing, and there was an equally doubtful reduction of Nylander's and Böttger's reagents. The urine was examined for milk sugar, inosite, and levulose, with negative results. The author then examined for pentose with phenylhydrazin, and found that an osazon formed in characteristic crystals, which had a melting-point of 159° C. On quantitative examination, the carbohydrate was found present to the amount of 0·352 per cent. The urine

gave a marked reaction with Tollin's phloroglucin method. From its reaction and the melting-point of the osazon there could be no doubt that the carbohydrate present in the urine was pentose. On testing the urine by Trommer's method, and using a relatively small amount of copper and heating for some time, no change appeared at first, but after a considerable time the reaction appeared slightly, with a precipitate of yellow oxyhydrate of copper. When the urine was treated with excess of Fehling's solution, it gave first a green and then a yellowish colour, but there was no precipitation of copper oxide. The patient was put upon a milk and flesh diet, and given arsenic. In the course of four months the eruption and the pentosuria had entirely disappeared.

18. Amyl hydrate in diabetes insipidus.

Brackman (*Therap. Monatshefte*, 1896) gives his experience of amyl hydrate in diabetes insipidus. The patient, whose grandmother died of diabetes mellitus, had suffered since childhood from diabetes insipidus to a greater or less degree, and had frequently been under treatment. In July, 1894, when twenty-one years of age, he was attacked with acute mental symptoms. The daily quantity of urine passed averaged 7,000 c.cm. It was pale, clear, without pathological constituents, and had a specific gravity of 1005. Till March, 1895, the diabetic condition remained unchanged. As he was suffering from sleeplessness, amyl hydrate was prescribed nightly in half-drachm doses. In the course of six days it was noted that the thirst had diminished, and the quantity of urine had fallen to 3,000 c.cm., with a specific gravity of 1011. On continuing the amyl hydrate, the quantity of urine varied between 2,800 and 2,000 c.cm. When the drug was discontinued, the urine secretion rapidly rose to 8,000 c.cm. When the drug was again exhibited, the polyuria diminished, while it recurred again whenever it was discontinued. The author considers an interrupted course of the drug should give good results in diabetes insipidus.

19. Diabetes insipidus.

Burgess (*Dublin Medical and Surgical Journal*, 1897) records a case of diabetes insipidus in which all the usual remedies were tried with little or no result. The only form of treatment which gave any benefit was an occasional purgative dose of calomel, a form of treatment first recommended by Golding Bird.

20. Levulosuria.

May (*Deutsch. Archiv für klin. Med.*, vol. lvii.) describes a case of levulosuria. The patient suffered from transverse myelitis. The urine answered to Trommer's test, gave an

osazon with phenylhydrazin, the crystals having a melting-point of 204-205°. On examination with the polarimeter, the urine was found to be levo-rotatory. On separating the carbohydrate from a large quantity of urine, it was found to answer to all the reactions of levulose.

IV.—DIURETICS.

21. Urea as a diuretic.

Klemperer (*Berlin. klin. Wochenschr.*, 1896) has strongly recommended the internal administration of urea as a diuretic on the ground that it is the natural diuretic. Thus in recent ascites, where he prefers the use of the diuretic agents to tapping, the administration of urea gave satisfactory results, the diuresis being marked. Urea he also considers indicated in the uric acid diathesis, as first recommended by **Rosenfeld** (*Centralbl. für klin. Med.*, 1895). Urea is a good solvent of uric acid, and Klemperer obtained better results with it in uric acid gravel, stone in the kidney, etc., than with piperazine or lysidin. Klemperer now records further results (*Deutsch. med. Wochenschr.*, 1896, No. 47), and still claims that in ascites and dropsy *where the kidneys are sound* urea has a valuable and marked diuretic action. **Kohn** (*Zeitschr. für Heilk.*, 1896), however, did not obtain such good results, though in his series of cases the kidneys were sound. The drug was tried in four cases of hepatic cirrhosis with ascites, two cases of pleurisy with effusion, one case of pericarditis with effusion, one case of tuberculous ascites, one case of ascites from carcinoma, and one case of ascites from cardiac disease. The urine passed in twenty-four hours was carefully measured, and the specific gravity taken. The effects of urea on the kidney excretion were compared with the effects of other recognised diuretics, such as diuretin, digitalis, calomel, and salicylate of soda. From his observations Kohn concludes that the action of urea is uncertain. Any action produced seemed to be through stimulating the secreting mechanism of the kidney.

Bettman (*Berliner klin. Wochenschr.*, 1896, No. 49) discusses Klemperer's results, and gives his own experience in the Heidelberg clinic, where the remedy was tried in twelve cases (three cases of liver cirrhosis with marked ascites, four cases of one-sided pleurisy with effusion, and five cases of dropsy). The remedy was given in doses of 150 gr. per diem in a watery solution, and was gradually increased to 300 gr. per diem after three to five days. The patients took on an average 900 gr. during the first five days. An increased diuresis during the prolonged consumption of

urea was only noticeable in three cases, and in three cases it could be accounted for without reference to the urea. The drug proved itself neither a rapidly acting nor an efficient diuretic.

V.—MISCELLANEOUS.

22. Renal pain.

Ralph (*Transactions of the Medical Society, London*, vol. xix.), discussing nephralgia where distinctive symptoms are absent, divides the condition into four varieties :—

(1) Reflex nerve disturbance, giving rise to kidney pains. As examples, the author quotes three cases of aortic disease where, as first described by Habershon, the pain, severe and colicky in character, radiated down into the right hypochondriac region. The urine was, as in the other instances, normal in character and quantity. A like condition may be seen in aneurysm of the thoracic or abdominal aorta, all the symptoms of renal colic being present, without any of the recognised signs. The same condition of simulated renal colic may be seen in some delicate women as the result of scybala in the colon.

(2) The second variety is described as the "aching kidney." It is generally associated with movable or floating kidney. This, however, is not always the case, for an aching kidney may be met in young ladies where no mobility of the organ can be detected. There are severe pain and tenderness over the right kidney, the organ at times being enlarged and palpable. The cause of the condition is to be found in tight corsets pressing down the liver. On active exercise a certain amount of perinephritis is set up, with acute symptoms. The condition is difficult to treat. If the patient consent to remain at rest for a month, all may go well; but if not, on rising from the recumbent posture, aching pains occur daily in the affected organ. A slight purulent deposit may appear in the urine, and an increased proportional amount of urea and the deposit of oxalate of lime crystals.

(3) Gouty paroxysm of the kidney, a true paroxysmal gout affecting the kidney, and difficult to distinguish from nephritis on the one hand and renal colic on the other. The attacks are of sudden onset, the pain and tenderness being, as a rule, confined to one side. There is pain on micturition, the urine is loaded with uric acid crystals, and some blood corpuscles and leucocytes are present. Between the attacks the urine is normal. The condition yields to gouty treatment.

(4) Diseases of the kidney. Under this heading the author *includes* cases of doubtful diagnosis on the border-line between

medicine and surgery, but not giving rise to determinate symptoms in the urine or to a tumour in the flank, so that no more than suspicion is aroused. Illustrative cases are quoted of obscure cases of suppression of urine with pain and other conditions where the diagnosis was doubtful.

Hurry Fenwick (*Trans. Med. Soc., London*, vol. xix.) divides renal pain from non-suppurative renal stone into two classes: (1) where the stone produces irritation of the cortex; (2) where the stone produces irritation of the pelvic mucous membrane. In the first class of case the stone is lodged in a cavity in the cortex of the kidney almost under the capsule. The pain is then felt at the angle which the last rib forms with the erector spinæ. It is strictly localised, and can be elicited by percussion, succussion, or exercise It is liable to exacerbations, but *never* radiates downwards towards the testis. There are no colics; the urine is normal, and blood may never be noticed. The pain is relieved by the recumbent posture. The position during sleep may be typical —the patient sleeps on the affected side. If he should turn during sleep on to the sound side, he is awakened by the pain.

In the second class of case, where the stone is loose, and pelvic irritation and ureter obstruction are produced, the pain is colicky, and radiates to the neck of the bladder, the groin, the testicle, and the thigh. The urine varies in quantity, and bladder irritation occurs. When asleep, the patient lies upon the sound side, so that the affected kidney may be exposed to no pressure.

The author admits that there are some cases which do not fall under these two groups, the symptoms partaking partly of both primary classes. The symptoms of one or other class may predominate in proportion as the stone is situated the nearer to the cortex or the pelvis.

Howitz (*Therap. Gazette*, No. 4, 1897) records four cases where all the symptoms of renal calculus were present, but on operation no stone was discovered. Recovery was complete after operation, the pain entirely disappearing. He conjectures that in these cases there must have been a mobility of the kidney too slight to be detected by palpation.

23. The treatment of nephritic colic.

Mantoux (*Lyon Méd.*, Nos. 12, 13, and 14, 1897), discussing the treatment of renal colic during the crisis, remarks that the object to be aimed at is the arrival of the stone in the bladder. This object may be aided in two ways: (1) by urging the stone downwards; (2) by making a way before it.

Propulsion towards the bladder may be employed either by producing *vis à tergo*, or by augmenting the secretion of urine, or by exercising direct pressure. Diuresis may be procured by administering large quantities of diuretic infusions and decoctions; but it must always be remembered that the method is only applicable within certain limits, and there is always the risk of increasing the tension within the kidney and thus favouring the dilatation of the ureter. The method should be used only in the slighter forms of colic. The method of exercising direct pressure by massage of the abdomen the author considers impracticable in most cases, on account of the anatomical relations of the ureter and the tenderness of the parts. When practicable, it must be regarded as by no means free from danger.

The second method of obtaining the passage of the stone by preparing a way for it consists in inhibiting the contractions of the ureter which prevent the stone from passing downwards. Different means may be used for this end.

Poultices, sinapisms, frictions, etc., have been tried, and have fallen into disuse. The best that can be said for them is that they are inoffensive, please the patient, calm his impatience, and gain time. Cupping, dry or wet, is useful and rapid in action, but the patient is apt to dread the procedure. Heat is a powerful agent for relief of the pain, but should not be applied in the form of a damp stupe, which may become displaced by the patient in his movements necessitated by the pain, and is objectionable on account of its weight. Much to be preferred is a bag filled with heated bran, or, more simply, a cataplasm of wool in layers heated before the fire or in the oven, applied to the region of the pain, and fixed in position with a bandage. The heat is kept in, the skin is not irritated, and the elastic pressure aids the action of the heat. The rubber hot bottle is too heavy to be used with advantage. Prolonged hot baths are of great value in aiding the expulsion of the stone, and also aiding the diuresis produced by the decoctions. The temperature of the bath should not be below 93° F., and, indeed, unless contraindicated by extraneous circumstances, can with benefit be raised to 100°–104° F. Careful supervision must, however, be exercised. A patient with nephritic colic, while in the bath, must be continuously under observation. Antispasmodic decoctions, such as henbane, added to the bath, are not to be despised, owing to their soothing effect on the general condition of the patient. The application of sedative liniments and ointments has but little effect. Sedatives should be employed internally—opium in its various preparations, belladonna, henbane, ether, chloral.

If liquids are not retained, powders in small volume may be tried, thus:—

℞ Morphinæ Hydrochloratis ... ... gr. $\frac{1}{16}$
Pulv. Belladonnæ ... ... gr. $\frac{1}{2}$

Sig. One to be taken every quarter of an hour.

Antipyrin has proved unsatisfactory on account of the difficulty which the stomach has in retaining it. When the stomach will not tolerate draughts, powders, or pills, the rectum should be used. Suppositories of belladonna and morphia can be administered. The tolerance for belladonna during the crisis is very great, the author stating that he has seen 12 grammes (185 grains) taken in twelve hours without any inconvenience. Enemata are superior to suppositories, as they are more easily prepared and more rapid in their action. The bowel is first cleared out by a simple enema, with the sedative enema to follow.

The following formula has proved very useful:—

℞ Chloral Hydrate ... ... gr. xxx–lx
Antipyrin ... ... gr. xxx
The yolk of one egg
Milk ... ... ℥iijss.
Fiat enema.

The effect is rapid and complete. In ten to fifteen minutes the pain diminishes, and the patient falls asleep. The unpleasant effects which follow the administration of morphia are not noticeable. In very extreme cases the inhalation of chloroform or ether may be made use of.

The hypodermic injection of morphia occupies the first place in the treatment of renal colic, on account of its rapidity of action and the certainty of its effects. The initial dose should not exceed $\frac{1}{12}$ of a grain, and may be repeated in a quarter of an hour. The author advises the combination of atropine with the morphia, to minimise the after-sickness. No other remedy given hypodermically can compare with morphia. Antipyrin and cocaine have given good results in some cases, but the hypodermic injection of antipyrin is accompanied with considerable pain.

24. Incontinence of urine in children.

Coutts (*Treatment*, No. 13, Sept. 9, 1897) speaks highly of lycopodium in the treatment of nocturnal enuresis in children. While belladonna acts by paralysing the detrusor muscle of the bladder, lycopodium seems to exert a selective sedative action on the vesical mucous membrane. The drug is best exhibited in the form of the tincture, commencing with a dose of twenty drops

three times daily, and gradually increasing the dose up to a drachm twice daily.

Betschinski (*St. Petersburg. med. Wochenschr.*, 1896) advises massage performed per rectum in the treatment of nocturnal enuresis. The treatment need only be mentioned to be condemned.

25. Quantitative estimation of albumin.

Wassiliew (*St. Petersburger med. Wochenschr.*, No. 37, 1896) compares the different methods for the estimation of albumin in the urine, and describes a titration method for which he claims great accuracy. A known quantity of urine was taken and titrated with a 25 per cent. solution of salicyl sulphonilic acid. As an indicator to show when all albumin had become precipitated and free salicyl sulphonilic acid was present, "Echt-gelb" was used. "Echt-gelb" is one of the aniline dyes, a weak solution of which is straw-coloured, but in the presence of free salicyl sulphonilic acid assumes a brick-red tint. It was found that 1 c.cm. of a 25 per cent. solution of salicyl sulphonilic acid precipitated 0·01006 gramme albumin. In carrying out the estimation 10 or 20 c.cm. of urine are taken, and, if dark-coloured, diluted with distilled water, 2 drops of a 1 per cent. solution of "Echt-gelb" are added, and the mixture is titrated with a 25 per cent solution of salicyl sulphonilic acid till a brick-red colour is obtained. The number of c.cm. of the acid solution used gives the amount of albumin, which can easily be calculated in percentage. In carrying out the process, the urine, if alkaline, must be first treated with acetic acid.

[The test is by no means as accurate as Wassiliew claims. If bile be present as well as albumin, the colour reaction is difficult or impossible to obtain. At other times, probably from the presence of varying amounts of acid salts in the urine, the results obtained by this test are quite at variance with results got by the gravimetric and other reliable methods of estimating albumin in the urine.]

26. Peptone in urine.

Bogomolow and **Wassilieff** (*Centralb. für med. Wissensch.*, No. 3, Jan. 16, 1897) discuss the different methods for estimation of peptone in the urine. They find that the preliminary use of saturation with ammonium sulphate to precipitate other proteids interferes with the peptone reaction in the filtrate. They advise that any albuminous bodies present in the urine be first precipitated with trichloracetic acid, and the filtrate then tested with the biuret reaction, when, if peptone be present, a beautiful rose-pink reaction is obtained.

27. Method of distinguishing albumin and peptone when present together in the urine.

Jaworski (*La Médecine Moderne*, 1897, No. 18) advises the following procedure: The urine is saturated with bicarbonate of soda and then filtered, evaporated to a third of its volume, shaken with amylic alcohol, and then neutralised with citric acid. To 4 c.cm. of this mixture a drop of ammonium molybdate solution is added. If the urine contains albumin or peptone, a precipitate forms. The fluid is then warmed and filtered; while warm any peptone will pass through into the filtrate to reprecipitate on cooling, while the albumin remains undissolved.

28. Test for the bile pigments in urine.

Jolles (*Zeitschr. für physiol. Chemie*, Vol. xx., No. 5) describes a modification of his test for bile pigment for which he claims great delicacy. 50 c.cm. urine are mixed with 5 c.cm. of a 10 per cent. barium chloride solution and chloroform in a separation funnel. The chloroform and the precipitate which forms are then easily separated, and the chloroform can be removed by evaporating over a water bath. If, then, a drop or two of strong sulphuric acid be allowed to fall upon the residue a characteristic green and blue ring forms if bile pigment be present.

29. New test for blood in the urine.

Zakarias Donogány (*Virchow's Archiv*, Vol. 148) describes a new method for the recognition of blood pigment in the urine. Ten cubic centimetres of urine are taken in a test-tube and 1 gramme of ammonium sulphate, and an equal quantity of pyridin are added. Instead of the addition of ammonium sulphate, the urine may be rendered strongly alkaline with caustic soda solution. On mixing the fluid, reduction occurs immediately, and if blood be present the mixture assumes a more or less intense orange-red colour, which is characteristic. If the urine contain only a little blood, it is advisable to examine the fluid in the test-tube by looking through it vertically against a white ground, the fluid first having stood to allow the coloured precipitate to fall. The fluid reduces blood-colouring matter to hæmochromogen, which can be submitted to spectroscopic examination if the colour be so faint as to be unappreciable to the eye. The author claims that the method is very simple and extremely sensitive.

30. Serum treatment of urinary infection.

Albarran and **Mosney** (*Annales des Maladies des Organes Génito-Urinaires*, No. X., Oct., 1896) discuss the treatment of genito-urinary infection by the injection of the serum of animals rendered immune against the bacillus coli communis. In preparing the serum three methods were used: (1) The inoculation of living cultures.

This method, it was found, did not produce a total and persisting immunity, and there was risk to the life of the animal injected, and, as secondary suppurations were frequently set up, the serum obtained could not be used. (2) The second method consisted in the inoculation of the filtrate of the macerated organs of animals which had died from the infection of the bacillus coli. These filtrates produced constant but very variable toxic phenomena. (3) The third and best method consisted in a combination of the first two, the alternate use of filtrate and virulent culture inoculations. By this method a serum was got which had a strong protective action against the bacillus coli infection.

The toxins of the bacillus coli produced in animals a constant rise of temperature, varying with the dose of the toxin administered. Clinically there may be no fever present in those affections of the urinary tract where bacillus coli is present, but, given a breach of continuity of the mucous surface, and elevation of temperature will follow absorption of the toxin.

The authors used the serum in infection of the urinary tract in man, and obtained good results. In addition to subcutaneous injection they advise the injection of diluted serum into the bladder in septic conditions, and anticipate good results from the method.

[The method may hold out good prospect of success in cases where the infection is due to the bacillus coli communis, but other organisms are found in urinary infection. Thus **Richta**, in 22 cases of cystitis found the bacillus coli 11 times, and in three of these cases other bacilli were present. In five cases proteus vulgaris was present in pure culture. Again, **Van Graf** (*Deutsch. med. Wochenschr.*, 1896, No. 38) records two cases of pyonephritis. In one, examination showed a small number of bacilli coli in pure culture, but the second gave an organism which has not hitherto been described, which, however, belongs to the same class as bacillus coli. The organism was highly pathogenic in the case of guinea-pigs and mice.]

GOUT, RHEUMATISM, AND RHEUMATOID ARTHRITIS.

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1. Gout.

The chemical pathology of gout was selected by A. P. Luff as the subject of his Gulstonian lectures for 1897 (*Lancet*, 1897, vol. i., pp. 857, 942, and 1069). After discussing the various theories which have been from time to time advanced in explanation of the phenomena of the disease, he proceeded to give an account of certain experimental investigations which he had carried out with the view of throwing further light upon some of the dark places of its pathology.

The first series of observations related to the occurrence of uric acid in the blood of men, mammalian animals, and birds. The blood to be examined was allowed to flow directly into its own volume of rectified spirit, to which 2 per cent. of formalin had been added. The mixture was thoroughly shaken and afterwards evaporated upon a water bath. The powdered residue was then extracted by boiling for half an hour with distilled water. After evaporation to a small bulk and filtration the Gowland Hopkins method for the estimation of uric acid was applied to the extract. It was found that when uric acid in known quantity was added to blood in which previously no uric acid was found, from 80 to 87 per cent. of the quantity added could be recovered by this means. Luff was unable to detect uric acid under normal conditions either in the blood of birds or mammals, and, seeing that birds excrete large quantities of ammonium urate, he holds that it can hardly be objected that in them the quantity present may be too small for detection by the method employed. He further confirms Sir A. Garrod's observation that the blood of birds, although free from uric acid, contains urea.

Luff therefore concludes that under normal conditions uric acid is formed in the kidneys alone, probably by the conjugation of urea and glycocin, but he holds that in such diseases as

leucocythæmia part of the excess of uric acid excreted has a different origin, being formed from nuclein.

The accumulation of urate in the blood in gout he ascribes to deficient excretion by the kidneys and consequent absorption from these organs, and he accepts the view that uric acid circulating in the blood as a soluble quadriurate has no toxic action, the morbid phenomena of gout being due to its deposition as sodium biurate in the tissues.

A further series of experiments showed that the solubility of uric acid in the blood is not affected by diminished alkalinity due to the addition of an organic acid; that diminished alkalinity of the blood does not hasten the deposition of sodium biurate or diminish its solubility.

Of special interest from the point of view of treatment are certain experiments which show that the mineral constituents of meat, milk, and vegetables respectively, differ remarkably in their influence upon the solubility of sodium biurate and upon the decomposition of the quadriurates. Whereas distilled water took up 1·10 per 1,000 of sodium biurate, and water with 1 per cent. of meat ash in solution 0·93 per 1,000, water containing 1 per cent. of vegetable ash (from potatoes, spinach, and beans) dissolved no less than 2·15 parts per 1,000. Again, whereas a solution of quadriurate in distilled water began to deposit crystals of uric acid at the end of half a minute, and a 0·1 per cent. solution of meat ash in one minute, the deposition of crystals from a 0.1 per cent. solution of vegetable ash only began at the end of two hours.

Luff further suggests that the gout-producing properties of certain wines are not due to their acidity, but more probably to their effect upon hepatic metabolism. The etherial salts to which old wines owe their bouquet did not, when extracted, hasten the decomposition of the quadriurate or diminish the solubility of the biurate.

In three interesting but long papers, of which lack of space forbids lengthy abstract here, **C. Mordhorst** discusses the deposition of urates in the tissues of gouty patients. (*Zeitschr. f. klin., Med.*, 1897, vol. xxxii., p. 65; *Virchow's Archiv*, 1897, vol. cxlviii., p. 285; *Verhandlungen des Cong. f. innere Med.*, 1896, vol. xiv., p. 405.)

He states that when uric acid is added to an alkaline fluid the base combines with it to form a urate, and that when, for any reason, the liquid becomes saturated with the urate so formed it is thrown down in the form of minute spherules which grow by accretion. The constitution of such granular urates (kugelurate)

varies according to the amount of alkali present, and when deposited in the tissues they become converted in time into the crystalline biurate. Saturation with urate is brought about either :—

By addition of more uric acid ;
By removal of the water in which the urate is dissolved ;
By cooling of the solution ; or
By reduction of its alkalinity.

Mordhorst dissents completely from Ebstein's well-known view that necrotic changes precede the deposition of sodium biurate in the tissues, and attributes the turbidity of the corneæ of rabbits which Ebstein observed after the injection of a solution of urate to the deposition of granular urate in the tissue.

He holds that under unfavourable conditions the fluids of the tissues liable to gouty inflammation may become neutral or even acid in reaction, and that the granular urate, which he believes to be always first deposited, or even sodium biurate itself, may consequently undergo decomposition with the formation of crystals of free uric acid, which may block even the larger lymphatics of the part, and so set up an acute gouty inflammation. Since, however, the acidity of the affected tissues can only be temporary, the free crystalline uric acid will be reconverted into granular urate when alkalinity is restored, and ultimately into sodium biurate, which forms the basis of the crystalline gouty deposits.

On this view the inflammatory process may be regarded as curative, since it causes an increased flow of alkaline blood through the part and encourages osmotic interchange between the focus of inflammation and the neighbouring capillaries.

In a paper entitled "The Uric Acid Diathesis: Are we to Continue to Believe in It?" (*Edin. Med. Journ.*, 1897, n.s. vol. ii., p. 35) **A. Haig** entirely discredits the existence of a uric acid diathesis, which he defines as a supposed tendency to excessive formation of uric acid. He attributes any excess of uric acid present in the body simply to its introduction in the food, and asserts that it is easy to show that a man on ordinary diet may put into his mouth as much as 6 to 8 gr. of uric acid each day. He states that uric acid is introduced into the body in the dead tissues of all animals, their extracts and decoctions, and in the alkaloids of tea, coffee, and cocoa. By putting a patient who suffers from symptoms due to uric acid upon a diet which introduces no uric acid Haig has found that when, in the course of a year or eighteen months, the previously stored up acid has been eliminated all the symptoms to which its presence gives rise disappear.

In a paper in the *Guy's Hosp. Reports*, 1895, vol. lii., p. 115, **J. Fawcett** gives the results of the examination of the urine in a series of cases of gout. He found the amount of uric acid excretion (which was estimated by the Gowland Hopkins method) to be very variable, but in the majority of cases it was below the average of healthy people on a like diet. During acute attacks an increased excretion was observed, usually most marked towards the end of the attack. The uric acid excretion did not vary inversely with the acidity of the urine, nor was there any definite relation between the amount of urine passed and the uric acid excretion.

As a rule, no increase of uric acid excretion followed the administration of colchicum, and an increase observed in two cases could be attributed to the supervention of acute attacks of gout.

Fawcett confirms Haig's observation that the output of uric acid is markedly increased by the administration of sodium salicylate, but he does not agree with that observer in attributing this to a clearing away of retained uric acid, because when this drug is given the excretion, after suddenly rising, may remain high, and may sometimes reach an even higher point during its continued administration. In two cases in which the leucocytes in the blood were counted before and during the administration of salicylate no conspicuous alteration in their number was observed. This last observation bears upon the suggestion of **Bohland** (*Centralb. f. innere Med.*, 1896, vol. xvii., p. 70) that the salicylate causes an increased output of uric acid, by producing leucocytosis, and consequently an increased breaking down of nuclein.

His (*Berliner klin. Wochenschr.*, 1896, vol. xxxiii., p. 70), who studied the uric acid excretion in seventeen cases, obtained regular results in all but three. He found that the acute attack was preceded by a diminished excretion followed by an increase to above the normal limits in the course of a few days. When attacks followed one another in rapid succession, this series of events was apt to be shortened or altogether masked.

Further observations have failed to confirm the opinion of **Kolisch** (see "Year-Book," 1897, p. 124), who, having found an increase of alloxuric substances (xanthin bases and uric acid) in the urine of gouty patients, based upon this an elaborate theory of the pathology of gout.

His, in the paper above referred to, states that he was unable to find any definite relation between gout and the alloxuric excretion. **Laquer** (*Verhandlungen des Cong. f. innere Med.*, 1896, vol. *xiv.*, p. 33) also failed to detect any constant increase of alloxuric

substances in the urine in this disease, or any constant increase in the relative proportion of xanthin bases to uric acid; and **Mafatti** (*Wiener klin. Wochenschr.*, 1896, vol. ix., p. 723) was equally unsuccessful in detecting any excessive alloxuric excretion beyond the physiological limits.

On the other hand, Laquer confirms the observations of Vogel and Schmoll, who found a well-marked diminution of the total nitrogen excretion in gouty patients, who in this respect resemble sufferers from renal disease.

An interesting survey of the older and of the more recent treatments of gout is given by **M. Sternberg** (*Deutsche med. Wochenschr.*, 1897, vol. xxiii., p. 167). He states that in Germany all are agreed that alcohol should be forbidden, and considers that the distinctions drawn in France and England between the various alcoholic liquors as regards their injurious influence in gouty cases rest upon no sound basis.

It is curious to find colchicum spoken of as an almost forgotten specific which was largely used in the first quarter of the present century, and the value of which might profitably be tested afresh.

His general conclusion is that, in spite of the researches of recent years, little progress has been made in the treatment of this disease.

In a paper on Piperazine (*Guy's Hosp. Reports*, 1894, vol. li., p. 67) **J. Fawcett** discusses the solvent action of this drug upon uric acid calculi, its value in the treatment of gout, and its effect when administered to birds in which uric acid deposits had been induced by injections of chromic acid.

His investigations led him to the following conclusions:—

(1) After the administration of piperazine in 15 gr. doses daily, the urine is useless as a solvent of uric acid calculi, and although a watery solution of piperazine (about 1 in 1,000) has a marked solvent action, a solution of piperazine in urine of the same strength is quite devoid of solvent action (see M. Mendelsohn, "Year-Book," 1894, p. 161).

(2) He reports as unfavourably upon its action in gouty cases. He found no constant increase in the uric acid excretion under its use, nor in most cases was any relief of pain obtained in the acute stages. In two cases attacks of acute abdominal pain, resembling renal colic, followed the administration of the drug.

(3) Lastly it was found that in pigeons injected with chromic acid the simultaneous administration of piperazine did not prevent the deposition of urate.

W. Armstrong (*Lancet*, 1897, vol. ii., p. 11) has seen great benefit

from an exclusively red-meat diet in certain selected cases of chronic gout. The diet consists in the early stages of 2–4 lbs. of minced beef-steak gently heated to brownness, the whites of several poached eggs, with a very scanty allowance of well-toasted bread and several pints of water at 100° to 120° F. daily. At a later period of the course a little variety within rigid limits is permitted. Full details will be found in the paper referred to. The course lasts from four to twelve weeks. Armstrong's experience leads him to regard the following as indications for the adoption of this treatment:—

(1) Obstinate and refractory chronic gouty arthritis.
(2) Recurrent uric acid calculi.
(3) Frequent and intractable migraine.
(4) Obstinate gouty dyspepsia;

more especially if these conditions be attended by amylaceous and intestinal dyspepsia with acidity, pyrosis and flatulence, heaviness and irritability after food, excessive formation of sulphuretted hydrogen in the intestine, persistent lithiasis, oxaluria, excess of indican, a purple or red reaction of the urine with nitric acid, or a wine-red reaction with ferric chloride.

In cases with damaged kidneys or a weakened heart he considers that exceptional care should be taken, and that many such cases are quite unfit for the treatment.

Armstrong is inclined to attribute the favourable results to a more perfect digestion of the food taken, to diminished fermentative changes in the intestine, and to flushing by the hot water taken —in a word, to the cessation of a pre-existing auto-intoxication.

In conclusion, he insists upon the irksome and trying character of the treatment; its limited application; its uselessness if not strictly carried out, and the necessity of a careful selection of cases; its unsuitability in most cases with persistent albuminuria or organic heart disease; and, lastly, the great improvement which may result from it in suitable cases.

T. Lauder Brunton (*Practitioner*, 1896, vol. lvii., p. 48) calls attention to the value of bromide of potassium and salicylate of sodium in the treatment of the irritable temper so often met with in gouty persons as well as in sufferers from cardiac disease.

W. Knowsley Sibley (*Lancet*, 1897, vol. ii., p. 88), whose results with the Tallerman hot-air baths in the treatment of rheumatoid arthritis were referred to last year (see "Year-Book" for 1897, p. 135), speaks equally favourably of their effect in gouty cases. In cases of acute articular gout so treated, the local pain and congestion were quickly relieved, and although in some cases the disease appeared in a second joint, these secondary attacks also

quickly yielded to the treatment. The duration of the attacks so treated was considerably less than that of previous attacks in the same patient. The results obtained did not appear to be in any way attributable to drugs simultaneously administered.

In very chronic cases in which there were tophaceous deposits around the joints, such deposits diminished in bulk or disappeared under the treatment. Sibley quotes the results of some observations carried out in the clinics of Landouzy and Déjerine, which were published by Crétien (*La Presse Médicale*, 1896, Dec. 26). It was found that a series of hot-air baths caused an increased elimination both of uric acid and urea in the urine, as well as of all salts, and especially of chlorides.

Taking these observations in conjunction with the solvent effect upon tophaceous deposits which he has observed, Sibley draws the inference that it is desirable, during the course, to assist the kidneys to act as freely as possible. He attributes the diminution of the tophi to the increased circulation in the part which results from the local application of the heated air.

Any *résumé* of the literature of the year would be very incomplete which did not refer to the appearance of **W. Ewart's** work on "Gout and Goutiness," and to **Sir William Roberts's** article on Gout in the third volume of Professor Allbutt's "System of Medicine."

2. Rheumatism.

Achalme, who in 1891 obtained and cultivated a bacillus from the heart and pericardium of a patient who succumbed to an attack of rheumatic fever, has recently found an identical bacillus from a second case (*C. R. de la Soc. de Biologie*, 1897, iv., p. 270). It was found abundantly in the pericardial fluid, heart's blood, iliac veins, and cerebro-spinal fluid, but not in the synovia of the affected joints. **J. Thiroloix** (*ibid.*, p. 268) has also obtained a similar organism from blood removed during life from the veins of patients suffering from acute rheumatism. The bacillus, which is described as large and of slight motility, is stained by Gram's method. It is rapidly fatal to guinea-pigs, kills rabbits only occasionally, and is innocuous to the rat and mouse.

F. Steiner (*Deutsches Archiv f. klin. Med.*, 1897, vol. lviii., p. 237) gives brief notes of thirty-five cases of rheumatic fever in which there was tenderness over nerve trunks and pain along their course, which he is inclined to attribute to an inflammation of the nerve sheaths comparable to that of the pericardium and pleura. The observed phenomena could not be ascribed to mere extension from the inflamed joints, for the perineuritis was sometimes much more extensive than the articular lesions, and

the nerves were sometimes affected in limbs the joints of which had escaped. Steiner also thinks that in many instances the so-called rheumatic muscular paralyses have this origin, and also arthritic muscular atrophy in so far as disuse will not account for it. Females were more often attacked than males, but age did not appear to exert much influence upon the development of perineuritis.

Steiner recommends the administration of potassium iodide with salicylate in these cases, and for the relief of pain in the nerves, when it is very severe, he prescribes antifebrin, antipyrin, or salipyrin.

L. Bergamaschi (*Il Morgagni*, 1896, vol. xxviii., p. 623) has obtained very satisfactory results from the intra-muscular injection of calomel in cases of acute and sub-acute rheumatism. The drug is injected, with strict antiseptic precautions, in doses of 10–15 centigrammes, intimately mixed with about a gramme of vaseline oil. In mild cases, without complications, a single injection is usually sufficient, but in severe cases it may require to be repeated. The chief claim which Bergamaschi makes for this treatment is that it tends to control the endocardial lesions, and in cases of first attacks with signs of incipient endocarditis these signs tended to disappear after the injections. In simple cases, in which the only local manifestations were in the joints, the drug acted promptly, and the symptoms tended to disappear in a few days.

M. Lannois and **G. Linossier** (*Lyon Méd.*, 1896, vol. lxxxiii., p. 75), who have made experiments upon the absorption of drugs when applied to the healthy skin, consider that the amount of absorption is chiefly dependent upon the volatility of the drug. They found that the methyl salicylate, which constitutes 90 per cent. of the oil of winter-green, is well absorbed, and appears, to a large extent, in the urine as salicylic acid.

They have treated cases of rheumatism and other articular diseases by such applications, carried out as follows:—A large sheet of guttapercha tissue is passed under the joint, and the salicylate is directly applied by means of a drop bottle; the tissue is then brought up so as to surround the joint, and is enclosed in some cotton wool and a bandage. When a large dose is given a piece of gauze may be laid upon the skin to suck up the salicylate of methyl, which is a liquid which boils only at 222° C., but emits vapour even at a low temperature. If the wrappings are carelessly applied, so that the vapour escapes, its effects are not observed, and salicylic acid does not appear in the urine. The dose employed is from 1 to 4 grms. daily.

In acute rheumatism the results obtained were comparable to those with sodium salicylate given by the mouth, and were very satisfactory. In rheumatoid arthritis remarkable relief of pain was observed, but was almost confined to the joint treated.

Further favourable results with this treatment have also been recorded by **G. H. Lemoine** (*Bull. et Mem. soc. Méd. des Hôp.*, 1897, 3ᵉ., xiv., p. 678); and **Armand Siredy** (*ibid.*, p. 688).

The advantages claimed for this treatment are :—(1) That it causes no digestive disturbance such as is not infrequently produced by salicylate of sodium ; (2) that in doses of 4 grms. daily it causes no toxic symptoms such as malaise, giddiness, and tinnitus; (3) that it has the advantages of a topical application to the seat of pain.

Beyond the care required for the satisfactory application of the drug, the only disadvantage appears to be its smell, which Lannois and Linossier describe as agreeable, but which Siredy says often becomes insupportable after a few days. It is less marked the more carefully the application is made.

Lemoine has used the salicylate in doses up to 12 grms. in the twenty-four hours, and found that with larger doses than this there was not apparently any increase in the amount absorbed.

Among the more lengthy contributions to the literature of rheumatism which have appeared during the present year, reference should be made to the articles of **Church** and **Cheadle** in the third volume of Prof. Allbutt's "System of Medicine," and articles by **Stephen Mackenzie** on the various forms of rheumatism in the *Edin. Med. Journ.* for January and February, 1897.

3. Rheumatoid arthritis.

G. F. Still (*Medico-Chirurgical Trans.*, 1897, vol. lxxx., p. 47) discusses certain forms of chronic joint disease occurring in children, which are usually described as rheumatoid arthritis, but which present for the most part important differences from that disease as seen in adults. He calls special attention to one form in particular, which is characterised by chronic progressive enlargement of joints, coupled with enlargement of the spleen and of the lymphatic glands. The disease is usually insidious in its onset, and begins, as a rule, before the second dentition. Sometimes the onset is more acute, with rigors. The changes met with suggest a general thickening of the periarticular structures rather than a development of new bone, and osteophytes are wanting even when the disease has persisted for years. The joints first affected are usually the knees, wrists, and joints of the cervical spine. The sterno-clavicular joint was attacked in two cases out of twelve, and the temporo-maxillary in three. There is no tendency to

suppuration or to bony ankylosis. Muscular atrophy is conspicuous in the neighbourhood of the affected joints. The glands related to the affected joints are chiefly enlarged, but the other palpable glands do not escape. The enlarged glands are firm, painless, and do not tend to break down. The glandular enlargement may vary side by side with the articular affection. Splenic enlargement is common in these cases, and bears some relation to the degree of glandular affection.

The cardiac valves are not affected, but in three cases pericardial adhesions were found *post mortem*.

Other symptoms observed were moderate anæmia, prominence of the eyeballs, periods of pyrexia, or even hyperpyrexia, and sweating. There is usually some arrest of bodily development.

The disease progresses very slowly, and death, when it occurs, results from intercurrent disorders. In three fatal cases the articular cartilages were found to be normal, or merely pitted at their edges, the pits being occupied by processes of thickened synovial membrane. There was marked thickening of the joint capsules and surrounding connective tissue. The spleen and glands appeared normal on section, but the latter sometimes exhibited small ecchymoses.

The paper concludes with a differentiation of this disease from certain other forms of chronic joint disease met with in children.

Cases of chronic arthritis in children affecting many joints have also been recorded by **F. G. Finley** (*Montreal Med. Journ.*, 1896, vol. xxv., p. 94), and **A. G. Nicholls** (*ibid.*, p. 98).

In some observations upon the blood-changes in rheumatoid arthritis **Bannatyne** (*Lancet*, 1896, vol. ii., p. 1510) shows that the anæmia which not infrequently accompanies that disease is of the chlorotic type, being due to deficient hæmoglobin-worth of the corpuscles, and, regarding rheumatoid arthritis as a bacterial disease (see "Year-Book," 1897, p. 132), he is disposed to attribute the blood-change to the action of toxins upon the hæmogoblin.

INFECTIOUS FEVERS.

By Sidney Phillips, M.D. Lond., F.R.C.P.,

Senior Physician to the London Fever Hospital; Physician to and Joint-Lecturer on Medicine at St. Mary's Hospital.

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1. Diet in typhoid fever.

A. G. Barrs (*Brit. Med. Journ.*, Jan. 19, 1897) contends that "we should enforce no further departure from the normal diet of health than the disease itself enforces by the inevitable loss of appetite and impaired digestion of the pyrexial state. When a patient suffering from typhoid fever expresses a genuine desire for solid food, and his expressed desire is confirmed by his physical condition, I give him such food as he can take, especially meat." He points out that perforation is not a common cause of death in typhoid, and he believes that "too much has been made of the ulceration in typhoid fever"; and "whatever food we put into the stomach, if it is digestible and the stomach is digesting," will reach the "seat of the typhoid lesion in the same state of fluidity, whether it be milk, beefsteak, bananas, or what not."

Barrs records two cases. One was that of a lady convalescing from typhoid, which began eight weeks before, but with an evening rise of temperature to 100°; she was put at once on a full diet. The other was that of a man who had had a severe attack of enteric. On the twenty-sixth day, his temperature being 102° in the evening, he was put on minced meat diet, and continued to take it, the pyrexia gradually lessening. Both cases completely recovered.

[Barrs's two recorded cases show that in some cases of typhoid fever solid food may be given before the establishment of a normal temperature without ill effect; it is, in the author's opinion, however, certain that in other cases the administration of solid food as soon as the patient craves for it has been followed by relapse, by rapid re-rise of temperature, or by hæmorrhage or by death. The author and others have recorded cases in which the ulceration of typhoid fever was very slight, and in such cases,

possibly, solid diet might do little harm even while pyrexia still existed; and no doubt, if the stomach is digesting well, solid food will in the main be liquefied before reaching the lower part of the small intestine. But the patient's craving for food can hardly be taken as a positive assurance of this, and it is not always possible to tell whether there be open ulcers or not in a given case of typhoid fever; the author therefore considers that liquid food should not be given until the temperature has been normal for three days, unless some local cause not in the intestine can be found to account for pyrexia. That perforation is not a common occurrence at present is in part, no doubt, due to the care taken to avoid solid food.—S. P. P.]

2. Treatment of perforating typhoid ulcer by operation.

In the *Med.-Chir. Society Transactions*, vol. lxxx., p. 119, **Lauder Brunton** records the case of a man, aged thirty-seven, whose temperature had remained normal or sub-normal for twenty-five days after an attack of typhoid fever, when slight pyrexia recommenced. A week later sudden abdominal pain, with tympanites and fall of temperature to 97°, suggested perforation of the intestine. The abdomen was opened by Mr. Bowlby; some dirty yellow fluid was found in the abdominal cavity, and a perforation of the ileum. Lembert's sutures were used to bring together the edges of the perforation, and recovery ensued.

In the *Transactions* of the same Society **Herringham** records a case in which a girl of thirteen experienced sudden severe pain in the abdomen seven days after convalescence had commenced from a typhoid attack; signs of collapse with tympanites and repeated retching came on, pointing to possible perforation of the bowel. The abdomen was therefore opened by Mr. Bowlby; no perforation was found. The girl recovered.

This case, in which symptoms occurred which are generally taken as indicating perforation and in which it was proved that no perforation occurred, is calculated to engender great doubt as to whether the cases of reported perforation and cure in typhoid without operation were ever cases of perforation at all; it is highly probable they were not, and it becomes more improbable than ever that spontaneous recovery after perforation in typhoid ever occurs. Any operation that affords the smallest chance is, therefore, justifiable, and the two cases of which abstracts are given above encourage operation in cases of perforation. Herringham's case shows that little harm may result even if no perforation has occurred, and Brunton's case supplies encouragement to hope that operation may be successful. This is the first successful

case of this nature performed in England; the other two successes were in America by **Van Hook** and **Abbe** respectively.

3. Widal's serum diagnosis test of typhoid fever.

Many observations have been made on the reliability of this test in the diagnosis of typhoid fever. The method was dealt with in the "Year-Book" for 1897, p. 144. It depends on the observation that the serum from a patient suffering from typhoid fever possesses the power of arresting the movement and "agglutinating" together the bacilli of Eberth from a cultivation.

R. Stern (*Centralbl. f. inn. Med.*, Dec. 5, 1896) says that the ninth day of typhoid fever was the earliest at which he obtained the serum reaction. Whereas **Widal** gives the requisite proportion of serum and culture to be 1 in 60 or 1 in 80, Stern finds it much more: 1 in 100 to even 1 in 2,000. A constant relation between agglutinative action and the severity of the disease could not be proved. **Pughesi** (*Rep. Med.*, Oct. 2, 1896) withdrew the serum from blisters in 16 cases of typhoid; in 13 of these the reaction was obtained. **Delépine** concludes from observations on nearly 90 cases that Widal's method gives very reliable results.

Hardke (*Deut. med. Woch.*, Jan. 7, 1897) obtained a positive result in every one of 22 cases; sometimes the agglutinating effect was instantaneous, and Hardke believes such cases may be looked upon as certain cases of typhoid fever; in other cases the bouillon test should be used in addition.

Widal and **Sicard** (*Annal. de l'Institut Pasteur*, 1897, No. 5) found the reaction absent in only 1 of 163 cases of typhoid. The reaction was found as early as the fifth day, and as late as twenty-six years, after convalescence; the date of its appearance bears no relation to the severity of the attack. The authors conclude that the agglutinating action is one belonging to the period of infection, and a positive reaction obtained according to the rules laid down by them (the serum being diluted never less than ten times) can be considered a pathognomonic sign of typhoid fever.

4. "Vaccination against typhoid fever."

Under this title **Professor A. E. Wright** and **Surgeon-Major Semple** contribute to the *Brit. Med. Journ.* of Jan. 30, 1897, an article of great interest. The "antityphoid vaccines" are made from agar cultures of typhoid bacilli which have been grown for twenty-four hours at a blood heat. The cultures thus obtained are emulsified by the addition of measured quantities of sterile broth; the emulsion is sealed up in glass pipettes. These "vaccines" are inoculated into the flanks. With small inoculations

the symptoms are slight—a little chilliness and pyrexia passing off in twenty-four hours; with larger doses the site of inoculation becomes inflamed, and red lines of inflamed lymphatics extend up to the axillæ. In two or three hours there is some faintness and collapse, and a good deal of fever and sleeplessness ensue. By the next day these symptoms have passed off.

Wright and Semple inoculated 18 persons, 16 of them being army medical officers. The blood required for testing the effect of the vaccination was obtained by pricking the finger; this blood was filled into capsules. After clotting, the serum was drawn off, diluted, and a small quantity of typhoid culture added to it. It was found that this serum possessed the power of immobilising and agglutinating the typhoid bacilli. This "sedimentation power" varied in degree, which could be estimated by making a series of successive dilutions of the serum, and by determining how far the blood may be diluted without losing its sedimentation power.

The authors then discuss whether we have any warranty for inferring that the blood of the person inoculated will exert such a deleterious influence on typhoid bacilli with which it comes into contact as will protect the person against typhoid. They give many reasons which tend to show that this is so, and since these vaccinations are unattended with risk, being inoculations of dead bacteria, they suggest it would be expedient for everyone who is likely to be frequently exposed to the risk of typhoid infection to undergo the vaccination, and particularly young soldiers going to typhoid-infected districts abroad and to persons in a district where there was an epidemic of typhoid.

Pfeiffer and **Kolle** (*Deut. med. Woch.*, Nov. 12, 1896) have been working on the same subject, and have shown that a single injection of a minimum dose of killed typhoid cultures induced a specific change in the blood, and regard it as more than probable that the appearance of specific bactericidal substances in the blood of patients who have had typhoid fever represents the chief cause of their immunity; if this is correct, then it is to be expected that these prophylactic inoculations in the killed typhoid cultures can produce the same immunity as that of an actual attack of typhoid fever.

5. Treatment of typhoid fever by antitoxic serum.

F. Pope, of Leicester, gives notes of four cases of typhoid fever treated in this manner in the *Brit. Med. Journ.*, Jan. 30, 1897; in one case the temperature was 105° when the first injection was given. The pulse rate, already rapid, rose to 144 per minute next day; eight injections were given, each 5 c.cm.; the patient

recovered, and in all the cases defervescence soon commenced after the injections. Pope considers, and the reports of the cases appear to support his view, that the serum had a beneficial action on the course of the disease.

P. R. Cooper, of Bowdon (*Brit. Med. Journ.*, Feb. 27, 1897), also records a case in which a case of severe typhoid, with melæna and hæmoptysis, recovered after several injections, each of 5 to 8 c.cm., of the serum were made.

Ernest Steele, of Plaistow (*Brit. Med. Journ.*, April 17, 1897), records the case of a female in whom, at about the end of the first week, he commenced the treatment by inoculations; five injections altogether were given, each of 10 c.cm., of Burroughs and Wellcome's serum. The headache was relieved by the injections, and Steele believes the attack was lessened in severity and duration by the treatment.

6. Treatment of scarlet fever by hot baths.

Schill (*Jahr. f. Kinderheilkunde*, Bd. xliii., p. 260, and *Epit.*, *Brit. Med. Journ.*, Jan. 16, 1897) advocates this mode of treatment. The cases in which it was tried were 110 in number; the temperature of the baths was 95° F., and the duration of each 10 minutes; they were given twice a day during the first week of the illness, afterwards once a day. In these cases desquamation occurred only on the fingers, the daily baths removing the epidermis as it exfoliated. Schill believes the scarlet fever poison is eliminated by the skin, and that this is favoured by the constant removal of the desquamating epidermis by hot baths; for the same reason he condemns greasy applications to the skin. [No doubt warm or hot baths are useful after the first week of scarlet fever, assisting the action of the skin; their use during the pyrexial period, however, appears inadvisable, and especially in cases where the temperature is very high; the author quite agrees that oily applications to the skin are prejudicial.—S. P. P.]

7. Treatment of scarlet fever by hypodermic injections of oil of turpentine.

The favourable results obtained in puerperal injection by oil of turpentine suggested its use also in grave scarlatina. One or two hypodermic injections of 1 gramme of oil of turpentine are used for children of three to six years, and two or three times as large a dose in adults, some alkali, such as bicarbonate of soda, being used with the turpentine to prevent local irritation. The turpentine is said to exert a favourable action in albuminuria following scarlet fever; not only does it appear to prevent its occurrence, but it soon increases the secretion of urine when that has become

deficient, and it rapidly disperses dropsy and albuminuria. The turpentine may be given by the mouth in capsules or in syrup (*La Médecine Infantile*, Sept., 1897.)

8. Antistreptococcic serum in scarlet fever.

In the "Year-Book" for 1897, p. 147, this treatment, first suggested by **Marmorek**, was dealt with; he pointed out that though the microbe of scarlet fever has not yet been discovered, the streptococcus plays an important part in the disease, and that to it many of the complications of the disease are attributable. The treatment with antistreptococcic serum was tried by **Josias** at the Trousseau Hospital; he found the course of the disease uninfluenced, though possibly the severity of the throat and glandular lesions was lessened.

In the Epitome of the *Brit. Med. Journ.*, Jan. 21, 1897, the results of the treatment in 16 cases by **Rappapart** are given. He used a solution of the serum containing ·5 per cent. of phenol; the serum, even when injected repeatedly, had no influence on the temperature or on the complications: 4 of the 16 patients died.

Baginsky has not found any marked advantage in the treatment.

H. Jackson (*Boston Med. Journ.*, No. 9, 1896) summarises reports of this mode of treatment. Marmorek used it in 96 cases, of which 17 were complicated with diphtheria; 10 c.cm. of the serum were injected daily till the temperature fell; the most marked effect was in cases with enlarged glands, 19 cases occurring without suppuration. Baginsky cured 48 cases with the serum; several had enlarged glands which went on to suppuration, and Baginsky merely says that the results were not less favourable than in previous years.

9. The antitoxin treatment of diphtheria.

It would serve no useful purpose here to give even an abstract of the numerous statistics which have been published during the year on the results of this treatment. Statistics as to the effects of a mode of treatment of any disease are merely misleading unless the ages of the patients and the character of the epidemic are taken into account, and, above all, unless the cases treated are undoubted cases of the disease in question. But, on the whole, the general consensus of opinion is favourable to the treatment, though it is yet far from having realised the extravagant claims at first made for it.

In England the largest body of figures are those published in the report on the antitoxin treatment by the medical officers of the Metropolitan Asylums Board infectious hospitals. Unfortunately the criterion of diagnosis of the tabulated cases

in these reports was clinical, not bacteriological; hence the figures given cannot be accepted as any *absolute* measure of the results of the treatment.

Nor can the comparison between the mortality percentage in 1894, before antitoxin, and the mortality percentage in 1896, be regarded as even approaching to accuracy, for the reasons: first, that in 1894 many cases were called diphtheria which were not true diphtheria; secondly, that in 1896 the very severe and the very mild cases were excluded from the antitoxin treatment; and thirdly, as above remarked, the cases in 1896 submitted to treatment as diphtheria were diagnosed by symptoms and not by bacteriological examination. These sources of fallacy are so important as to make any comparison of little value.

The opinions, however, of the results of the treatment, apart from figures, formed by the medical officers themselves, must be regarded as of great value, and they are almost united in their favourable opinion of the treatment.

It is satisfactory to find that the whole mortality, including those cases treated by antitoxin and those not, fell from 25·5 in 1895 to 20·8 in 1896, and the mortality percentage of those treated with antitoxin in 1895, which was 28·1, fell to 25·9 in 1896. In both these years antitoxin was used, and the reduced mortality goes to show that increased experience in dosage and frequency of administration have had favourable effects.

The fact which was insisted on last year in the "Year-Book," that the diminished mortality was almost wholly in the *laryngeal* cases, is even more evident in the statistics of 1896 than of 1895. In 1894, before the employment of antitoxin, the mortality in the *laryngeal* cases was 62 per cent., whereas in 1896, when antitoxin was used, it was 29·6 per cent.—a reduction of 32 per cent.; in the *non-laryngeal* cases the reduction in the mortality was only 4·2 per cent. (from 23·8 to 19·6).

The reasons why the laryngeal cases are those that benefit most from the treatment are: Such cases early produce symptoms that call for treatment, and allow of the early administration of antitoxin, while cases of pharyngeal diphtheria give rise to less urgent symptoms, and often do not come under medical notice until the diphtherial poison has been absorbed beyond any power of antagonism. Another reason why the laryngeal cases derive so much more benefit from antitoxin than other cases is that in them the most urgent danger is the mechanical obstruction of the larynx by the membrane, the separation of which is hastened by antitoxin.

A somewhat important point comes out in the report of the medical officers—viz., that the death-rate of the cases treated by

antitoxin, but which subsequently proved to be not diphtheria cases, was 36·1 per cent., a considerably higher mortality than that of the diphtheria cases themselves. This is somewhat important, as tending to show that antitoxin in cases other than real diphtheria may be actually harmful.

Taking this fact together with the very small reduction in the mortality in the non-laryngeal cases, it is quite open to question whether it is advisable to give antitoxin in such cases. The dangers of non-laryngeal diphtheria are, as a rule, toxic or paralytic; and toxic symptoms once set up, the antitoxin is of but little avail, and of none whatever in diphtheritic paralysis.

10. Antitoxin injections as a prophylactic against diphtheria.

Kármán (*Pester med. chir. Presse*, Oct., 1896, and *Epit. Brit. Med. Journ.*, Jan. 16, 1897), on behalf of the Hungarian Government, tried preventive inoculation in 114 children in a village in which diphtheria was prevalent up to the date when the inoculations were performed; only one subsequent case of diphtheria occurred, and this was in a non-inoculated child.

Of 460 persons immunised at the Poliklinik in Berlin, 18 contracted the disease, but none died (*Archiv. of Pediatrics*, Feb. 18, 1897, p. 127). [Numerous deaths have been recorded after preventive injections of antitoxin serum; these were detailed in the "Year-Book" of 1897. Taking this with the above evidence that the inoculations do not in all cases produce immunity against diphtheria, and that there is some evidence that antitoxin given when no diphtheria is present may produce injurious effects, the writer considers that the injection of antitoxin as a prophylactic is not justifiable.—S. P. P.]

11. Treatment of diphtherial conjunctivitis.

Rotch (*Archiv. of Pediatrics*, Oct., 1897) records the case of a boy of nine years of age, who suffered from a membranous exudation on the conjunctiva of each upper lid, with great œdema of the lids. Cultures showed typical Klebs-Loeffler bacillus. Antitoxin was injected, and improvement ensued which was temporary only. On the advice of Dr. Standish, the injections of antitoxin were repeated every sixteen hours; in all eight injections were given. The eyes progressively improved, and eventually quite recovered.

[There seems no reason why antitoxin should not benefit diphtheritic exudation on the conjunctiva as well as on the mucous surfaces, but, so far as we know, no such cases have been previously recorded.—S. P. P.]

The temperature previous to the antitoxin injection was not over 100°, but during the treatment there was considerable

pyrexia (up to 105°), with enlarged cervical glands, and streptococci were found in the throat, but no Klebs-Loeffler bacilli. There was also abundant urticaria, and it would appear that these effects were attributable to the antitoxin.

12. Treatment of small-pox by ichthyol.

Kollbassenko (*La Médecine Moderne*, April 21, 1897) recommends ichthyol locally applied in small-pox. As soon as the pustules appear the skin should be anointed with ichthyol, 30 drachms; oil of sweet almonds, 2½ ounces; lanolin, 5 drachms. This allays itching and pain, and modifies suppuration and pitting.

MEDICAL DISEASES OF CHILDREN.

By Dawson Williams, M.D. Lond., F.R.C.P.,

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Occasion has been taken in several previous issues of the "Year-Book" to observe that one of the most important advances, probably the most important advance, which has been made in that department of medicine which is particularly concerned with the treatment of disease in infancy and childhood, is the more general recognition of the importance of infectious processes in the production of those disorders of the gastro-intestinal tract which are the cause of so large a part of the very high mortality that still prevails in the early years of life. The influence of ideas of this order has been shown by the very general adoption of sterilised milk as an article of diet, and by the very general use of antiseptic remedies in the treatment of acute diarrhœa and also of chronic enteritis.

1. Sterilised and modified milk.

Among the objections which have been raised to the use of sterilised milk are that it produces scurvy, and perhaps rickets and anæmia, and that it tends to render the infant constipated. **Kingston Barton** has given (*Brit. Med. Journ.*, 1897, vol. i., p. 14) the results of his experience during two years in a series of propositions which may be summarised as follows :—(1) Completely sterilised milk—that is, milk which will keep fresh in bottles hermetically sealed for several or many days—will produce scurvy unless some fresh food is administered daily. (2) Milk raised to the boiling-point or, better, to within two degrees of the boiling-point, and maintained at that temperature for five to fifteen minutes, is "comparatively" sterilised, will never produce scurvy, and is almost quite safe from pathogenic organisms. (3) "Comparatively sterilised" milk, if administered at once in perfectly clean bottles, spoons, or cups, can be relied upon as free from any pathogenic bacteria. (4) The heating of milk alters very slightly, if at all, its nourishing qualities. (5) If "completely sterilised" *milk is* used, scurvy may be avoided by giving one meal of fresh

whey daily to infants too young to take fresh vegetables, meat, or fruit. Various writers, especially Angel Money, have drawn attention to the freedom with which fruit and vegetables, if wisely selected, may be given; and **Lahmann** (quoted in *Pediatrics*, April 15, 1897) gives fresh fruit juice after the twelfth week, and after the fifth month one meal of vegetables also. When there is a tendency to constipation, he gives fruit juices earlier than the third month. Among fruit juices he prefers that of the orange; among vegetables, to begin with, spinach reduced to a pap. **Rotch** has recurred to the advantages of **modified milk**—that is to say, cow's milk prepared in a laboratory, so that it contains the precise proportion of fat, sugar of milk, and proteid which may be ascertained to be most appropriate to the digestive powers of each individual child. He expresses (*Arch. of Ped.*, April, 1897) the opinion that many premature infants have died owing to failure to recognise the need for such modification based on the assumption that the mother's milk must be suitable. In a premature child the gastro-intestinal tract is imperfectly developed, and its functions, in consequence, are overtaxed by normal human milk. For a child born at the seventh month the percentage composition of the modified milk should, as a rule, be: Fat, 1; sugar, 3 or 4; proteid, 0·35. Smaller percentages might be used even in an infant born at term in some cases; and he found it advisable to increase the percentages of the constituents, of the proteid especially, slowly and gradually. In a large number of infants of about six months, treated for diarrhœa, his average prescription had been: Fat, 2·6; sugar, 5·8; proteid, 1·2; and the average quantity at each feeding had been 4·5 oz. In the healthy adult the gastric juice has an antiseptic action, and the stomach has been called a "sterilising chamber"; but **Soltau Fenwick** concludes ("Disorders of Digestion in Infancy and Childhood," London, 1897) that in the infant it "must rather be regarded as a natural form of incubator, in which every species of micro-organism that finds an entrance with the food is afforded every facility for growth and multiplication." Free hydrochloric acid in proportions greater than 0·17 per cent. exerts an inhibitive action on the growth of micro-organisms, and the plentiful secretion of gastric juice in the adult has probably for this reason a valuable antiseptic power; but he has found that in the infant the proportion of free hydrochloric acid is inconstant, and that, as a rule, none can be detected until eighty minutes after a meal of breast milk has been taken; after a meal of cow's milk, though the total acidity of the gastric contents is more pronounced, free hydrochloric is only to be detected towards the end of digestion.

This absence of free hydrochloric acid is due to the fact that the proteid constituents of milk possess the power of entering at once into combination with the hydrochloric acid as it is secreted; consequently there can be no free hydrochloric acid in the stomach after a meal of milk until all the proteid has been saturated, and therefore any bacteria which obtain entrance to the stomach with the food are permitted to flourish until at least the end of digestion. It may be added that in many infants, owing to the unnecessary frequency with which they are fed, the stomach must seldom or never be empty, and the antiseptic powers of the gastric juice can rarely come into play.

2. Acute gastro-enteritis.

The doctrine that the more acute forms, at least, of enteritis are due to infection is generally accepted, but hitherto very little precise information has been obtained as to the nature of the infection. **Lesage** has shown that one form, probably a rare type, of summer diarrhœa is associated with the presence in the intestines of a special bacillus which produces a green pigment. In this form lactic acid gives good results. **Luebbert** (quoted in *Rev. des Mal. de l'Enf.*, Jan., 1897) has isolated from milk which had been boiled a bacillus which grew easily at body temperature on agar, serum, and potato, and produced spores which were not killed by a temperature of boiling water for two hours. This bacillus when grown in milk did not alter the smell or taste, did not attack the sugar or fat, but peptonised the casein. Such milk produced violent diarrhœa in young guinea-pigs. If the milk, however, were again boiled before administration, and then given at once, it did not produce diarrhœa, an observation which is quoted as a further proof of the undesirability of keeping even sterilised milk for any length of time before it is used, since this particular bacillus, if present, would be able to multiply in the milk, which would then, in all probability, cause diarrhœa. **Finkelstein** (*Brit. Med. Journ.*, *Epit.*, 1896, vol. ii., No. 398) has described a bacillus present in the purulent masses contained in the stools of acute follicular enteritis; and **Escherich** and his pupils, **Hirsh** and **Libman** (*Cent. f. Bakt.*, Bd. xxii. S. 369 and S. 376), appear to have proved that a form of acute enteritis, characterised by severe general symptoms and the passage of muco-purulent bloodstained stools, is due to infection by a streptococcus, which is not streptococcus pyogenes, and is probably a species hitherto undescribed. It was found abundantly in the stools during the persistence of the diarrhœa, and in one case, which recovered, when the number diminished the diarrhœa also diminished, and the general condition of the child improved. In the fatal cases

the streptococcus was found in the blood and urine, but not in the case which recovered. In the treatment the best results were obtained from the use of clysters of the solution of acetate of aluminium; by the mouth small doses of calomel were given, followed by tannalbin. **Tannalbin** is a compound of tannin and albumin. It contains 50 per cent. of tannin and is not decomposed in the stomach, but decomposition takes place slowly in the intestines. It is a pale yellow, tasteless powder, and the dose recommended for a child of four years is about seven grains repeated every two hours, or in very severe cases every hour, until three or four doses have been taken. The course may be repeated on the next day if necessary (*Form. des Médicam. Nouv.*, Paris, 1897). The drug has been found useful not only in acute but also in chronic diarrhœas, even in those due to tuberculosis. There seems to be at present a disposition to recur to the use of astringents in the treatment of infantile diarrhœa, and to have recourse to compounds of tannin, from which the tannin is liberated in the intestines. **Vandenberghe** (*Brit. Med. Journ. Epit.*, 1897, vol. i., No. 84) speaks highly of tannigen (diacetylic tannin, see "Year-Book" for 1897, p. 160) both in acute and chronic diarrhœa; and **Comby** commends both tannigen and tannalbin, but in infective cases combines them with calomel or some other antiseptic (*Brit. Med. Journ.*, *Epit.*, 1897, vol. ii., No. 258). The good results which commonly follow the withdrawal of milk and other easily decomposed forms of food at the commencement of an attack of acute diarrhœa has been very generally recognised, and Heubner, a couple of years ago (see "Year-Book" for 1896, p. 155), recommended the use of weak starchy mixtures. **Watu** has since (*Brit. Med. Journ.*, *Epit.*, 1897, vol. i., No. 307) reported that in Grancher's service in Paris infantile diarrhœa is treated by a strict regimen of boiled water cooled to a suitable temperature, and given in small quantities every hour or half-hour, or as thirst demands, for eight, twelve, or twenty-four hours. The results in children not very young are reported to be extremely satisfactory in acute diarrhœa. The water, it is assumed, dilutes the toxic matters, washes away *débris* of decomposing food, dissolves toxins attached to formed elements, and tends to increase the blood pressure. **Epstein**, some years ago, reported very favourable results in the acute summer diarrhœa of infants from the injection into the connective tissues of saline solution (10 c.c. three times a day). He attributed the good effect to dilution of the blood. Injection of blood serum, it is asserted, is followed by dilution of the blood owing to transudation of lymph from the tissues into the blood; **V. Ranke**, of Munich, therefore

suggested the use of injections of blood serum in summer diarrhœa, on the ground that it would not only produce the desired alteration in the blood but would supply the system with a certain amount of nutriment. The results of the test are reported by **Reinach** (quoted in *Pediatrics*, April, 1897). The serum used was that of cows previously ascertained to be in good health. The injections were given in fifteen cases, all severe examples of gastro-intestinal disturbance in bottle-fed infants. The injections were made under the skin over the thorax, usually in the evening, and the quantity used was 10 to 20 c.c. Improvement was, as a rule, first noticed on the following morning. If the child had been collapsed it was brighter, the temperature had become normal, the circulation better, the fontanelle more tense, and the extremities warmer. Eleven of the patients recovered. In one only a measles-like eruption appeared two weeks after the injection, and lasted two days.

3. Acute abdominal distension.

Still, in a paper on "Acute Abdominal Distension in Children," illustrated by photographs of typical cases has given (*Pediatrics*, September, 1897) an excellent description of a condition which, as he observes, is often one of the immediate causes of death in various exhausting diseases in childhood and infancy, but especially in those in which intestinal disorders are the primary or one of the complicating conditions. Three main seats of the distension may be distinguished according as the stomach, the small intestine, or the large intestine is chiefly involved. Any one of these parts may be affected alone, or all three may be distended together. Still concludes that the distension is due, probably in all cases, chiefly to loss of tone in the gastric or intestinal walls owing to the exhausted condition of the child, but that other factors are probably often present, such as catarrhal conditions of the gastro-intestinal tract. The distension produces rapid and laboured respiration, due to interference with the action of the diaphragm, but Still believes that in some cases there is also interference with the action of the heart, and that this may cause sudden death. The condition is an extremely serious complication, but treatment is not very effectual. The pressure on the diaphragm may be diminished and some relief obtained by propping the child up with pillows, and causing it to lie on the side instead of on the back. Ammonia and ether by the mouth, and hypodermic injections of strychnine and brandy, should be used as remedies for the general exhaustion. If the immediate danger be tided over, the most valuable drug is creasote. Mechanical treatment for the relief of the distension appears to be indicated,

but has not been found very easy of application. If localised distension makes it probable that the stomach is specially affected, the passage of an œsophageal tube may give great relief. The passage of a long soft tube (soft catheter) *per rectum* may bring away some gas, but more often it fails. This failure is explained by the observation *post mortem* that in most cases in which the colon is distended throughout the rest of its course the sigmoid flexure, which in early childhood is long and tortuous, as well as the rectum, are empty and contracted. If the small intestine be the part distended, very little can be expected from the use of the rectal tube. He thinks enemata of soap and water or of turpentine worthy of trial, though they have generally proved useless, and if retained may aggravate the condition. He suggests that puncture of the intestine may be justifiable as a last resource.

4. Tetany.

The nature and pathology of tetany have continued to attract much attention. It was one of the main topics of discussion at the meeting of the Gesellschaft für Kinderheilkunde at Frankfort (*Verhandlungen*, Wiesbaden, 1897), and again in the Section of Pædiatrics at the International Congress at Moscow. The frequency with which the condition occurs appears to vary in different countries, but as in a large proportion of cases the symptoms are latent—*e.g.* in 83 out of 109 observed by **Fischl**, (*loc. cit.* S. 27)—it is probable that many cases are overlooked. The main point at issue is whether tetany is, or is not, a direct product of rickets, which certainly co-exists in a very large proportion of cases—according to Fischl, in 60·4 per cent. **Kassowitz** has again argued strongly in favour of this connection (*Neur. Cent.*, 1897, S. 238). He believes the immediate cause to be some toxic bodies which are absorbed by the respiratory passages from the foul air of crowded rooms, but that this cause is able to produce the characteristic effect only in rickety subjects. He concludes, therefore, that the treatment should be directed to the cure of rickets. For this purpose he uses a phosphorus which he regards as specific for rickets. **Oddo**, in a very admirable review of the literature (*Rev. de Méd.*, 1896) has argued in favour of the view that the essential cause of tetany in childhood is, in most cases at least, a toxæmia, due to the absorption of the products of imperfect digestion associated either with dilatation of the stomach or enteritis, or both. To this view Kassowitz has objected that tetany in children and infants is most common in the winter months, whereas gastro-intestinal disturbances are most frequent and severe in summer; but, as **Biedert** pointed out during the discussion at

Frankfort, tetany occurs as a complication of chronic digestive disturbances which favour the absorption of toxic substances, and not of acute disturbances in which probably toxic matters are more quickly eliminated. The condition is of practical importance, because its recognition will put the practitioner on his guard; cases of rickets and gastro-enteritis in which it occurs very often turn out to be of a serious character, even though at the time the general condition may not appear to justify any anxiety. In many cases the symptom which attracts attention first is œdema of the backs of the hands and feet, though other symptoms of tetany may be elicited. In all cases the first indication, as Oddo observes, will be to correct any discoverable errors in diet. When gastric digestion is incomplete and delayed, a small dose of hydrochloric acid, with or without the addition of pepsin, shortly after each meal will be desirable; and it may be necessary to reduce the bulk of the meals while decreasing the intervals between them, should there be evidence of dilatation of the stomach. Calomel in small doses frequently repeated is recommended as the best corrective of the decomposition within the intestines, but it may be replaced or supplemented by benzo-naphthol or bismuth subnitrate. Cold is a frequent determining cause of the attacks during which the child suffers much pain; and care should therefore be taken to guard it against exposure, as well as to protect the patient from excitement. During an attack, when there are extensive and painful spasms, warm baths are the most effective remedies, but it may be necessary also to give chloral, preferably by enema. When an attack is complicated by laryngeal spasm, relief may often be obtained by applying a sponge soaked in very hot water to the front of the neck; if this fail, chloroform should be administered by inhalation.

5. Whooping cough.

Ritter, in a paper on the ætiology and treatment of whooping cough, read at the Frankfort meeting of the Gesellschaft für Kinderheilkunde (*Verhandl.*, Wiesbaden, 1897) advanced additional evidence in support of the view that the diplococcus tussis convulsivæ described by him in 1892 is the specific cause of whooping cough. He finds it to be sparingly present during the primary catarrhal stage, exceedingly plentiful during the spasmodic stage, and scanty in the later stages. **Koplik** has since, at the Montreal meeting of the British Medical Association, described a small bacillus which he found to be the predominating organism present in 13 out of 16 cases examined for this purpose. The two observations appear to be incompatible, but Ritter's views on the value of drugs in the disease are worthy of record,

since they are founded upon a large number of comparative trials. He considers that the only drugs upon which any reliance can be placed are quinine and bromoform. Treatment by belladonna, potassium bromide, chloral hydrate, and morphine he regards as merely symptomatic, while antipyrin should be avoided owing to its undesirable secondary effects. He treated 200 out of 215 consecutive cases with quinine or bromoform. The first two cases were treated with quinine, the next two with bromoform, and so on alternately until each drug had been taken by 100 patients. He gave the hydrochlorate of quinine; the dose was $1\frac{1}{2}$ gr. for each year of age, and for children under one year $\frac{1}{3}$ gr. for each month of life. Of bromoform he gave to infants under six months one drop three times a day, from six to nine months one drop four times a day, from nine months to two years two drops three times a day, and above that age as many drops as many times a day as a child had years; thus a child of five years had five drops five times a day. These doses, rather smaller than those recommended by **Stepp**, were found to be quite as effectual as the larger. The result of this comparison was very much in favour of bromoform. Of the 100 children treated with quinine two died, of the 100 treated with bromoform one died, and these must be eliminated from the list. Of the 99 treated by bromoform 42 had recovered by the end of three and a half weeks, and 71 at the end of the fourth week; whereas of those treated with quinine only one had recovered in three and a half weeks, and only five at the end of the fourth week. Severe vomiting and bleeding after the paroxysms ceased earlier in those cases treated with bromoform than in those treated with quinine. Thus these symptoms disappeared on or before the sixth day of treatment in 55 cases under bromoform, and in only 11 under quinine within the same period.

ANÆSTHETICS.

By Dudley W. Buxton, M.D., B.S., M.R.C.P.,

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I.—LOCAL ANÆSTHESIA.

Considerable attention has been paid to Schleich's **infiltration method** (see "Year-Book of Treatment," 1897, for details) and several surgeons have reported many successful operations performed by its aid.

Anesin (Vámossy: *Ungarische med. Presse*, No. 2, 1897; also *Centralbl. f. Chirur.*, Aug. 14, 1897) is a watery solution of acetonic acid trichloride (acetone chloroform). A 1 per cent. equals a 2 or $2\frac{1}{2}$ per cent. solution of cocaine. It is sterile, and remains so, is non-irritating and non-poisonous.

Alexander (Bellevue, *N.Y. Med. Journ.*, 1897, Jan. 30) uses **cocaine** in litholapaxy in the following way: The bowels being emptied, a subcutaneous injection of gr. $\frac{1}{6}$ morphine and $\frac{1}{100}$ gr. of atropine is given half an hour before the operation. Fifteen minutes later, glonoin $\frac{1}{60}$ gr. and strychnia $\frac{1}{30}$ gr. are given. The patient is then placed on the table, and after the bladder is washed out with boric acid solution, 2 ounces of a 4 per cent. solution of cocaine are injected into the bladder, the catheter being withdrawn into the prostatic urethra so that the solution is brought into contact with the deep urethra. The anterior urethra is then filled with cocaine solution, which is retained for five minutes.

The use of **guaiacol,** first suggested as a local anæsthetic by **Lucas-Championnière,** has been extensively employed in nasal or laryngeal surgery by **Laurens** (*Ann. des Malad. de l'Oreille*, xxii., 1896, p. 9). He makes a solution in previously purified oil and wipes it over the field of operations or, in the case of the ear, by instillation fifteen or twenty minutes before the operation. He *first washes* out the nose with solution, then puts in a tampon

saturated with it. He was able to remove the posterior extremities of the turbinates, but had to wait fifteen or twenty minutes. There is less retraction of the tissues than is the case with cocaine. In tonsillotomy and intra-laryngeal operations guaiacol seems less useful. **Gerondi** used an alcoholic solution of guaiacol (guaiacol 2 grammes, alcohol and distilled water āā 15 grammes at 90°, with a few drops of oil of bergamot or oil of vanilla to cloak the odour). He succeeded with this solution whilst cauterising the turbinates and pharyngeal granulations, and in removing naso-pharyngeal polypi and aural polypi. It was of less value in dealing with middle-ear trouble, as the field became obscured. **J. E. Newcomb** (*N.Y. Med.Journ.*, Aug. 28, 1897) found the following formula to answer best: To a given weight of oil 10 per cent. of dried sulphate of zinc (by weight) is added, and the mixture heated over a water bath for an hour. After filtration, 12½ per cent. absolute alcohol is added. After keeping a few days it is decanted, and then the guaiacol added to the required strength. Newcomb has used it for the nasal polypi, middle turbinates, curetting ethmoid cells, sawing of septal spurs, cauterising the turbinate bones, tonsils, and granular pharynx. He obtained anæsthesia in ten minutes, and did not observe any more hæmorrhage than occurred when cocaine was used.

Chronic cocaine poisoning is not always easy to diagnose. According to **Rybakoff** (*Neurolog. Centralblatt*, Aug., 1896), Magnan's "symptom" is pathognomonic. It is a sensation of some foreign body beneath the skin, variously described by the patient as "sand," "microbes," "worms," "crystals," etc.

Eucaine.

Horne and **Yearsley** (*Brit. Med. Journ.*, Jan. 16, 1897) describe their investigations into the action of this drug. A 2 per cent. solution sufficed for laryngoscopic rhinoscopy and aural examinations. For operations on the nose, throat and ear they employed a 5 per cent. or 8 per cent. solution. They instil warm solution into the ear; for the nose or throat swabs are soaked in the solution, which may, or may not be, left in the nose. About five or ten minutes sufficed to produce anæsthesia lasting twenty minutes. They never sprayed eucaine, and never had bad results. Slight salivation appeared in some cases. They deny the statement that eucaine makes the tissues hyperæmic. **Charteris** (*Proc. Roy. Soc. Edin.*, 1897) has arrived at similar conclusions. Eucaine kills more slowly than cocaine, and a larger dose is required. In dental practice 5 drops of a 10 per cent. solution injected into the gum are used to prevent pain during extraction.

Advantages and disadvantages of eucaine in surgical treatment of the eye.

Wustefeld (*Münch. med. Woch.*, Dec. 22, 1896) used 5 per cent. watery solution in twenty operations on the eye. The patient complained of sharp burning pains, which persisted. There was enlargement of the sclerotic vessels. The anæsthesia equalled that of cocaine. The pupils were unequal, and paralysis of accommodation took place in thirty minutes. Microscopic examination of rabbits' eyes under eucaine showed that the epithelial cells were swollen, and in some cases the upper layers separated.

Hackenbruch (quoted in *Wien. med. Blätt.*, July 22, 1897) used equal parts of cocaine and eucaine, and found the combination more useful and less poisonous than cocaine.

Spencer (*Med. and Surg. Reporter*, Nov., 1896) has used 5 per cent. eucaine solution in major operations, injecting as much as 2 drachms without unpleasant symptoms.

Scognamiglio (*Therapist*, No. 4. 1897) affirms that the anæsthesia produced by eucaine is more complete and persistent than that due to cocaine. He employed an 8 per cent. and a 10 per cent. solution for diseases of the throat, and found a more rapid and extended area of anæsthesia than with cocaine. **Perlati** has used eucaine successfully in dental practice. In minor surgery injections of 10 per cent. solution are recommended. It is far less toxic than cocaine.

De Mets (*Deutsche med. Zeit.*, July 29, 1897) has used eucaine extensively. He finds that anæsthesia appears in seven minutes after instilling a 20 per cent. It lasts thirty minutes, and is followed by no mydriasis or unpleasant symptoms.

Lewis Somers (*Therap. Gaz.*, Jan., 1897) speaks well of eucaine in non-inflammatory affections of the nose and naso-pharynx. He employs a 4 per cent. solution.

Reichert (Berlin) claims for it that it exerts a curative influence on the Schneiderian membrane.

Guttmann (*Deutsche med. Wochensch.*, No. 11, 1897) describes the properties of **holocaine** (p. diæthoxyæthenyldiphenylamidin). The chloride of the crystalline base is soluble in $2\frac{1}{2}$ per cent. of cold water. Boiling does not decompose a 1 per cent. solution. In ophthalmic practice instilling 2 to 5 drops of this causes burning sensation, which is lost in a minute. Three to 5 drops produce absolute anæsthesia of the cornea in a minute, lasting for nine minutes. The tension of the eyeball and accommodation were unchanged. It is poisonous if injected beneath the skin, and cannot be sterilised except in vessels—*e.g. porcelain*—free from alkali.

II.—GENERAL ANÆSTHETICS.

The preparation of a patient for an anæsthetic is dealt with by **Silk** ("Treatment," March 23, 1897). He recommends giving a purge the night before the administration of the anæsthetic. In ordinary cases a cup of hot broth, beef-tea, or some light fluid food should be given three or four hours before the operation. Milk is liable to delay digestion. A too prolonged fast is to be deprecated. In cases of special gravity—*i.e.* either from the feeble condition of the patient or probable shock from the operation—other measures are suggested. These consist in giving half an hour before the operation a nutrient enema of a yolk of an egg and an ounce each of beef-tea, milk, and brandy, the whole being peptonised; taking care to wash the bowel out with warm water before giving the enema. The only occasion when it is justifiable to give stimulants by the mouth before the anæsthetic is, Silk thinks, when the patient is threatened with syncope from fright. Otherwise he regards the practice as irrational. Hypodermic medication, the same writer thinks, should be used with caution. The routine employment of morphine before chloroform is, he considers, dangerous, since it may "mask the symptoms of over-narcosis." **Bernard, Nussbaum, Kappeler,** and **Koenig,** who analysed seven thousand such cases, pointed out that if a small dose of the opiate (gr. $\frac{1}{8}$) be given twenty-five or thirty minutes before the chloroform, not only was less of the anæsthetic required but the narcosis was more quiet and more peaceful than when morphine was not used. Strychnine (gr. $\frac{1}{30}$) may be injected immediately after anæsthesia has been induced, to counteract operation shock in the case of very feeble subjects. By some strychnine thus given is believed to lessen the liability to sickness. The injection may be repeated if occasion seems to demand it. **Ramsay** and **Newman** (*Lancet*, Jan. 23, 1897) point out that the tendency of chloroform to decompose by access to air leads to sickness and imperfect anæsthesia. If the drug is well shaken with slaked lime and filtered this is prevented.

Writing upon **chloroform in obstetrics, E. P. Davis** (*Boston Med. and Surg. Journ.*, Aug. 26, 1897) remarks that pregnancy lessens anæmia, increases vascular tension, produces eccentric cardiac hypertrophy, while during labour the abdominal muscles, the diaphragm, and the uterus are intermittently active, thus causing an intermittent compression upon the abdominal vessels. All these conditions lessen the dangers of chloroform to the parturient woman. Blood pressure is much increased during the pains, while the activity of the respiratory centre is naturally

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2. Acute gastro-enteritis.

The doctrine that the more acute forms, at least, of enteritis are due to infection is generally accepted, but hitherto very little precise information has been obtained as to the nature of the infection. **Lesage** has shown that one form, probably a rare type, of summer diarrhœa is associated with the presence in the intestines of a special bacillus which produces a green pigment. In this form lactic acid gives good results. **Luebbert** (quoted in *Rev. des Mal. de l'Enf.*, Jan., 1897) has isolated from milk which had been boiled a bacillus which grew easily at body temperature on agar, serum, and potato, and produced spores which were not killed by a temperature of boiling water for two hours. This bacillus when grown in milk did not alter the smell or taste, did not attack the sugar or fat, but peptonised the casein. Such milk produced violent diarrhœa in young guinea-pigs. If the milk, however, were again boiled before administration, and then given at once, it did not produce diarrhœa, an observation which is quoted as a further proof of the undesirability of keeping even sterilised milk for any length of time before it is used, since this particular bacillus, if present, would be able to multiply in the milk, which would then, in all probability, cause diarrhœa. **Finkelstein** (*Brit. Med. Journ.*, *Epit.*, 1896, vol. ii., No. 398) has described a bacillus present in the purulent masses contained in the stools of acute follicular enteritis; and **Escherich** and his pupils, **Hirsh** and **Libman** (*Cent. f. Bakt.*, Bd. xxii. S. 369 and S. 376), appear to have proved that a form of acute enteritis, characterised by severe general symptoms and the passage of muco-purulent bloodstained stools, is due to infection by a streptococcus, which is not streptococcus pyogenes, and is probably a species hitherto undescribed. It was found abundantly in the stools during the persistence of the diarrhœa, and in one case, which recovered, when the number diminished the diarrhœa also diminished, and the general condition of the child improved. In the fatal cases

the streptococcus was found in the blood and urine, but not in the case which recovered. In the treatment the best results were obtained from the use of clysters of the solution of acetate of aluminium; by the mouth small doses of calomel were given, followed by tannalbin. **Tannalbin** is a compound of tannin and albumin. It contains 50 per cent. of tannin and is not decomposed in the stomach, but decomposition takes place slowly in the intestines. It is a pale yellow, tasteless powder, and the dose recommended for a child of four years is about seven grains repeated every two hours, or in very severe cases every hour, until three or four doses have been taken. The course may be repeated on the next day if necessary (*Form. des Médicam. Nouv.*, Paris, 1897). The drug has been found useful not only in acute but also in chronic diarrhœas, even in those due to tuberculosis. There seems to be at present a disposition to recur to the use of astringents in the treatment of infantile diarrhœa, and to have recourse to compounds of tannin, from which the tannin is liberated in the intestines. **Vandenberghe** (*Brit. Med. Journ. Epit.*, 1897, vol. i., No. 84) speaks highly of tannigen (diacetylic tannin, see "Year-Book" for 1897, p. 160) both in acute and chronic diarrhœa; and **Comby** commends both tannigen and tannalbin, but in infective cases combines them with calomel or some other antiseptic (*Brit. Med. Journ., Epit.*, 1897, vol. ii., No. 258). The good results which commonly follow the withdrawal of milk and other easily decomposed forms of food at the commencement of an attack of acute diarrhœa has been very generally recognised, and Heubner, a couple of years ago (see "Year-Book" for 1896, p. 155), recommended the use of weak starchy mixtures. **Watu** has since (*Brit. Med. Journ., Epit.*, 1897, vol. i., No. 307) reported that in Grancher's service in Paris infantile diarrhœa is treated by a strict regimen of boiled water cooled to a suitable temperature, and given in small quantities every hour or half-hour, or as thirst demands, for eight, twelve, or twenty-four hours. The results in children not very young are reported to be extremely satisfactory in acute diarrhœa. The water, it is assumed, dilutes the toxic matters, washes away *débris* of decomposing food, dissolves toxins attached to formed elements, and tends to increase the blood pressure. **Epstein**, some years ago, reported very favourable results in the acute summer diarrhœa of infants from the injection into the connective tissues of saline solution (10 c.c. three times a day). He attributed the good effect to dilution of the blood. Injection of blood serum, it is asserted, is followed by dilution of the blood owing to transudation of lymph from the tissues into the blood; **V. Ranke**, of Munich, therefore

suggested the use of injections of blood serum in summer diarrhœa, on the ground that it would not only produce the desired alteration in the blood but would supply the system with a certain amount of nutriment. The results of the test are reported by **Reinach** (quoted in *Pediatrics*, April, 1897). The serum used was that of cows previously ascertained to be in good health. The injections were given in fifteen cases, all severe examples of gastro-intestinal disturbance in bottle-fed infants. The injections were made under the skin over the thorax, usually in the evening, and the quantity used was 10 to 20 c.c. Improvement was, as a rule, first noticed on the following morning. If the child had been collapsed it was brighter, the temperature had become normal, the circulation better, the fontanelle more tense, and the extremities warmer. Eleven of the patients recovered. In one only a measles-like eruption appeared two weeks after the injection, and lasted two days.

3. Acute abdominal distension.

Still, in a paper on "Acute Abdominal Distension in Children," illustrated by photographs of typical cases has given (*Pediatrics*, September, 1897) an excellent description of a condition which, as he observes, is often one of the immediate causes of death in various exhausting diseases in childhood and infancy, but especially in those in which intestinal disorders are the primary or one of the complicating conditions. Three main seats of the distension may be distinguished according as the stomach, the small intestine, or the large intestine is chiefly involved. Any one of these parts may be affected alone, or all three may be distended together. Still concludes that the distension is due, probably in all cases, chiefly to loss of tone in the gastric or intestinal walls owing to the exhausted condition of the child, but that other factors are probably often present, such as catarrhal conditions of the gastro-intestinal tract. The distension produces rapid and laboured respiration, due to interference with the action of the diaphragm, but Still believes that in some cases there is also interference with the action of the heart, and that this may cause sudden death. The condition is an extremely serious complication, but treatment is not very effectual. The pressure on the diaphragm may be diminished and some relief obtained by propping the child up with pillows, and causing it to lie on the side instead of on the back. Ammonia and ether by the mouth, and hypodermic injections of strychnine and brandy, should be used as remedies for the general exhaustion. If the immediate danger be tided over, the most valuable drug is creasote. Mechanical treatment for the relief of the distension appears to be indicated,

but has not been found very easy of application. If localised distension makes it probable that the stomach is specially affected, the passage of an œsophageal tube may give great relief. The passage of a long soft tube (soft catheter) *per rectum* may bring away some gas, but more often it fails. This failure is explained by the observation *post mortem* that in most cases in which the colon is distended throughout the rest of its course the sigmoid flexure, which in early childhood is long and tortuous, as well as the rectum, are empty and contracted. If the small intestine be the part distended, very little can be expected from the use of the rectal tube. He thinks enemata of soap and water or of turpentine worthy of trial, though they have generally proved useless, and if retained may aggravate the condition. He suggests that puncture of the intestine may be justifiable as a last resource.

4. Tetany.

The nature and pathology of tetany have continued to attract much attention. It was one of the main topics of discussion at the meeting of the Gesellschaft für Kinderheilkunde at Frankfort (*Verhandlungen*, Wiesbaden, 1897), and again in the Section of Pædiatrics at the International Congress at Moscow. The frequency with which the condition occurs appears to vary in different countries, but as in a large proportion of cases the symptoms are latent—*e.g.* in 83 out of 109 observed by **Fischl**, (*loc. cit.* S. 27)—it is probable that many cases are overlooked. The main point at issue is whether tetany is, or is not, a direct product of rickets, which certainly co-exists in a very large proportion of cases—according to Fischl, in 60·4 per cent. **Kassowitz** has again argued strongly in favour of this connection (*Neur. Cent.*, 1897, S. 238). He believes the immediate cause to be some toxic bodies which are absorbed by the respiratory passages from the foul air of crowded rooms, but that this cause is able to produce the characteristic effect only in rickety subjects. He concludes, therefore, that the treatment should be directed to the cure of rickets. For this purpose he uses a phosphorus which he regards as specific for rickets. **Oddo**, in a very admirable review of the literature (*Rev. de Méd.*, 1896) has argued in favour of the view that the essential cause of tetany in childhood is, in most cases at least, a toxæmia, due to the absorption of the products of imperfect digestion associated either with dilatation of the stomach or enteritis, or both. To this view Kassowitz has objected that tetany in children and infants is most common in the winter months, whereas gastro-intestinal disturbances are most frequent and severe in summer; but, as **Biedert** pointed out during the discussion at

Frankfort, tetany occurs as a complication of chronic digestive disturbances which favour the absorption of toxic substances, and not of acute disturbances in which probably toxic matters are more quickly eliminated. The condition is of practical importance, because its recognition will put the practitioner on his guard; cases of rickets and gastro-enteritis in which it occurs very often turn out to be of a serious character, even though at the time the general condition may not appear to justify any anxiety. In many cases the symptom which attracts attention first is œdema of the backs of the hands and feet, though other symptoms of tetany may be elicited. In all cases the first indication, as Oddo observes, will be to correct any discoverable errors in diet. When gastric digestion is incomplete and delayed, a small dose of hydrochloric acid, with or without the addition of pepsin, shortly after each meal will be desirable; and it may be necessary to reduce the bulk of the meals while decreasing the intervals between them, should there be evidence of dilatation of the stomach. Calomel in small doses frequently repeated is recommended as the best corrective of the decomposition within the intestines, but it may be replaced or supplemented by benzo-naphthol or bismuth subnitrate. Cold is a frequent determining cause of the attacks during which the child suffers much pain; and care should therefore be taken to guard it against exposure, as well as to protect the patient from excitement. During an attack, when there are extensive and painful spasms, warm baths are the most effective remedies, but it may be necessary also to give chloral, preferably by enema. When an attack is complicated by laryngeal spasm, relief may often be obtained by applying a sponge soaked in very hot water to the front of the neck; if this fail, chloroform should be administered by inhalation.

5. Whooping cough.

Ritter, in a paper on the ætiology and treatment of whooping cough, read at the Frankfort meeting of the Gesellschaft für Kinderheilkunde (*Verhandl.*, Wiesbaden, 1897) advanced additional evidence in support of the view that the diplococcus tussis convulsivæ described by him in 1892 is the specific cause of whooping cough. He finds it to be sparingly present during the primary catarrhal stage, exceedingly plentiful during the spasmodic stage, and scanty in the later stages. **Koplik** has since, at the Montreal meeting of the British Medical Association, described a small bacillus which he found to be the predominating organism present in 13 out of 16 cases examined for this purpose. The two observations appear to be incompatible, but Ritter's views on the value of drugs in the disease are worthy of record,

since they are founded upon a large number of comparative trials. He considers that the only drugs upon which any reliance can be placed are quinine and bromoform. Treatment by belladonna, potassium bromide, chloral hydrate, and morphine he regards as merely symptomatic, while antipyrin should be avoided owing to its undesirable secondary effects. He treated 200 out of 215 consecutive cases with quinine or bromoform. The first two cases were treated with quinine, the next two with bromoform, and so on alternately until each drug had been taken by 100 patients. He gave the hydrochlorate of quinine; the dose was $1\frac{1}{2}$ gr. for each year of age, and for children under one year $\frac{1}{3}$ gr. for each month of life. Of bromoform he gave to infants under six months one drop three times a day, from six to nine months one drop four times a day, from nine months to two years two drops three times a day, and above that age as many drops as many times a day as a child had years; thus a child of five years had five drops five times a day. These doses, rather smaller than those recommended by **Stepp**, were found to be quite as effectual as the larger. The result of this comparison was very much in favour of bromoform. Of the 100 children treated with quinine two died, of the 100 treated with bromoform one died, and these must be eliminated from the list. Of the 99 treated by bromoform 42 had recovered by the end of three and a half weeks, and 71 at the end of the fourth week; whereas of those treated with quinine only one had recovered in three and a half weeks, and only five at the end of the fourth week. Severe vomiting and bleeding after the paroxysms ceased earlier in those cases treated with bromoform than in those treated with quinine. Thus these symptoms disappeared on or before the sixth day of treatment in 55 cases under bromoform, and in only 11 under quinine within the same period.

ANÆSTHETICS.

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I.—LOCAL ANÆSTHESIA.

Considerable attention has been paid to Schleich's **infiltration method** (see "Year-Book of Treatment," 1897, for details) and several surgeons have reported many successful operations performed by its aid.

Anesin (Vámossy: *Ungarische med. Presse*, No. 2, 1897; also *Centralbl. f. Chirur.*, Aug. 14, 1897) is a watery solution of acetonic acid trichloride (acetone chloroform). A 1 per cent. equals a 2 or $2\frac{1}{2}$ per cent. solution of cocaine. It is sterile, and remains so, is non-irritating and non-poisonous.

Alexander (Bellevue, *N.Y. Med. Journ.*, 1897, Jan. 30) uses **cocaine** in litholapaxy in the following way: The bowels being emptied, a subcutaneous injection of gr. $\frac{1}{6}$ morphine and $\frac{1}{100}$ gr. of atropine is given half an hour before the operation. Fifteen minutes later, glonoin $\frac{1}{50}$ gr. and strychnia $\frac{1}{80}$ gr. are given. The patient is then placed on the table, and after the bladder is washed out with boric acid solution, 2 ounces of a 4 per cent. solution of cocaine are injected into the bladder, the catheter being withdrawn into the prostatic urethra so that the solution is brought into contact with the deep urethra. The anterior urethra is then filled with cocaine solution, which is retained for five minutes.

The use of **guaiacol,** first suggested as a local anæsthetic by **Lucas-Championnière,** has been extensively employed in nasal or laryngeal surgery by **Laurens** (*Ann. des Malad. de l'Oreille*, xxii., 1896, p. 9). He makes a solution in previously purified oil and wipes it over the field of operations or, in the case of the ear, by instillation fifteen or twenty minutes before the operation. He *first washes* out the nose with solution, then puts in a tampon

saturated with it. He was able to remove the posterior extremities of the turbinates, but had to wait fifteen or twenty minutes. There is less retraction of the tissues than is the case with cocaine. In tonsillotomy and intra-laryngeal operations guaiacol seems less useful. **Gerondi** used an alcoholic solution of guaiacol (guaiacol 2 grammes, alcohol and distilled water āā 15 grammes at 90°, with a few drops of oil of bergamot or oil of vanilla to cloak the odour). He succeeded with this solution whilst cauterising the turbinates and pharyngeal granulations, and in removing naso-pharyngeal polypi and aural polypi. It was of less value in dealing with middle-ear trouble, as the field became obscured. **J. E. Newcomb** (*N. Y. Med. Journ.*, Aug. 28, 1897) found the following formula to answer best: To a given weight of oil 10 per cent. of dried sulphate of zinc (by weight) is added, and the mixture heated over a water bath for an hour. After filtration, 12½ per cent. absolute alcohol is added. After keeping a few days it is decanted, and then the guaiacol added to the required strength. Newcomb has used it for the nasal polypi, middle turbinates, curetting ethmoid cells, sawing of septal spurs, cauterising the turbinate bones, tonsils, and granular pharynx. He obtained anæsthesia in ten minutes, and did not observe any more hæmorrhage than occurred when cocaine was used.

Chronic cocaine poisoning is not always easy to diagnose. According to **Rybakoff** (*Neurolog. Centralblatt*, Aug., 1896), Magnan's "symptom" is pathognomonic. It is a sensation of some foreign body beneath the skin, variously described by the patient as "sand," "microbes," "worms," "crystals," etc.

Eucaine.

Horne and **Yearsley** (*Brit. Med. Journ.*, Jan. 16, 1897) describe their investigations into the action of this drug. A 2 per cent. solution sufficed for laryngoscopic rhinoscopy and aural examinations. For operations on the nose, throat and ear they employed a 5 per cent. or 8 per cent. solution. They instil warm solution into the ear; for the nose or throat swabs are soaked in the solution, which may, or may not be, left in the nose. About five or ten minutes sufficed to produce anæsthesia lasting twenty minutes. They never sprayed eucaine, and never had bad results. Slight salivation appeared in some cases. They deny the statement that eucaine makes the tissues hyperæmic. **Charteris** (*Proc. Roy. Soc. Edin.*, 1897) has arrived at similar conclusions. Eucaine kills more slowly than cocaine, and a larger dose is required. In dental practice 5 drops of a 10 per cent. solution injected into the gum are used to prevent pain during extraction.

Advantages and disadvantages of eucaine in surgical treatment of the eye.

Wustefeld (*Münch. med. Woch.*, Dec. 22, 1896) used 5 per cent. watery solution in twenty operations on the eye. The patient complained of sharp burning pains, which persisted. There was enlargement of the sclerotic vessels. The anæsthesia equalled that of cocaine. The pupils were unequal, and paralysis of accommodation took place in thirty minutes. Microscopic examination of rabbits' eyes under eucaine showed that the epithelial cells were swollen, and in some cases the upper layers separated.

Hackenbruch (quoted in *Wien. med. Blätt.*, July 22, 1897) used equal parts of cocaine and eucaine, and found the combination more useful and less poisonous than cocaine.

Spencer (*Med. and Surg. Reporter*, Nov., 1896) has used 5 per cent. eucaine solution in major operations, injecting as much as 2 drachms without unpleasant symptoms.

Scognamiglio (*Therapist*, No. 4. 1897) affirms that the anæsthesia produced by eucaine is more complete and persistent than that due to cocaine. He employed an 8 per cent. and a 10 per cent. solution for diseases of the throat, and found a more rapid and extended area of anæsthesia than with cocaine. **Perlati** has used eucaine successfully in dental practice. In minor surgery injections of 10 per cent. solution are recommended. It is far less toxic than cocaine.

De Mets (*Deutsche med. Zeit.*, July 29, 1897) has used eucaine extensively. He finds that anæsthesia appears in seven minutes after instilling a 20 per cent. It lasts thirty minutes, and is followed by no mydriasis or unpleasant symptoms.

Lewis Somers (*Therap. Gaz.*, Jan., 1897) speaks well of eucaine in non-inflammatory affections of the nose and naso-pharynx. He employs a 4 per cent. solution.

Reichert (Berlin) claims for it that it exerts a curative influence on the Schneiderian membrane.

Guttmann (*Deutsche med. Wochensch.*, No. 11, 1897) describes the properties of **holocaine** (p. diæthoxyæthenyldiphenylamidin). The chloride of the crystalline base is soluble in $2\frac{1}{2}$ per cent. of cold water. Boiling does not decompose a 1 per cent. solution. In ophthalmic practice instilling 2 to 5 drops of this causes burning sensation, which is lost in a minute. Three to 5 drops produce absolute anæsthesia of the cornea in a minute, lasting for nine minutes. The tension of the eyeball and accommodation were unchanged. It is poisonous if injected beneath the skin, and cannot be sterilised except in vessels—*e.g.* porcelain—free from alkali.

II.—GENERAL ANÆSTHETICS.

The preparation of a patient for an anæsthetic is dealt with by **Silk** ("Treatment," March 23, 1897). He recommends giving a purge the night before the administration of the anæsthetic. In ordinary cases a cup of hot broth, beef-tea, or some light fluid food should be given three or four hours before the operation. Milk is liable to delay digestion. A too prolonged fast is to be deprecated. In cases of special gravity—*i.e.* either from the feeble condition of the patient or probable shock from the operation—other measures are suggested. These consist in giving half an hour before the operation a nutrient enema of a yolk of an egg and an ounce each of beef-tea, milk, and brandy, the whole being peptonised; taking care to wash the bowel out with warm water before giving the enema. The only occasion when it is justifiable to give stimulants by the mouth before the anæsthetic is, Silk thinks, when the patient is threatened with syncope from fright. Otherwise he regards the practice as irrational. Hypodermic medication, the same writer thinks, should be used with caution. The routine employment of morphine before chloroform is, he considers, dangerous, since it may "mask the symptoms of over-narcosis." **Bernard, Nussbaum, Kappeler,** and **Koenig,** who analysed seven thousand such cases, pointed out that if a small dose of the opiate (gr. $\frac{1}{5}$) be given twenty-five or thirty minutes before the chloroform, not only was less of the anæsthetic required but the narcosis was more quiet and more peaceful than when morphine was not used. Strychnine (gr. $\frac{1}{60}$) may be injected immediately after anæsthesia has been induced, to counteract operation shock in the case of very feeble subjects. By some strychnine thus given is believed to lessen the liability to sickness. The injection may be repeated if occasion seems to demand it. **Ramsay** and **Newman** (*Lancet*, Jan. 23, 1897) point out that the tendency of chloroform to decompose by access to air leads to sickness and imperfect anæsthesia. If the drug is well shaken with slaked lime and filtered this is prevented.

Writing upon **chloroform in obstetrics, E. P. Davis** (*Boston Med. and Surg. Journ.*, Aug. 26, 1897) remarks that pregnancy lessens anæmia, increases vascular tension, produces eccentric cardiac hypertrophy, while during labour the abdominal muscles, the diaphragm, and the uterus are intermittently active, thus causing an intermittent compression upon the abdominal vessels. All these conditions lessen the dangers of chloroform to the parturient woman. Blood pressure is much increased during the pains, while the activity of the respiratory centre is naturally

enhanced. He recommends chloroform in the natural labour of women whose apprehension of pain is exceptionally acute, to relieve the reflex inhibition of the uterus and reflex spasm set up by the severity of the pangs. For some obstetric operations ether is, he thinks, to be preferred. **Döinhoff** (*Archiv f. Gynäkol.*, Bd. 42, Sept. 2, 1897) gives his results obtained by the use of the tokodynamometer, which prove that light anæsthesia does not affect, while deep chloroformisation will check, uterine contraction. In transversé presentations, after loss of the amniotic fluid, with threatened rupture of the tetanic uterine muscle, chloroform will, Davis finds, give a far better chance for successful version than ether. Similarly he prefers it in cases of retained placenta when uterine tetanus exists; for eclampsic conditions chloroform, being, it is asserted, less irritating to the kidneys, is to be preferred to ether. It is contended that the fear that *post-partum* hæmorrhage will result if chloroform is employed during labour or operative interference is not supported by experience, provided care be taken that the anæsthesia is not too profound or continued for too great a length of time. Ether is to be preferred when forceps have to be applied, in order that the uterine contraction may be retained as fully as possible. Davis, however, does not appear to recognise the fact which Snow pointed out fifty years ago, that ether acts even more powerfully in relaxing muscular tissue than does chloroform, only it requires a larger dose acting over a longer time. No doubt if ether is used simply as an analgesic it is, as Davis says, more valuable than chloroform in forceps operations. **Worcester** (*loc. cit.*) points out that ether is of less value in parturition than chloroform, because the patient has not time between the pains to get sufficiently under its influence to become relieved. This is probably the result of imperfection in his methods. With a hand Clover's inhaler or an Ormsby there would be no difficulty of this kind. He speaks well of a mixture suggested by **Otis**, of Boston, composed of one part bromide of ethyl, three parts of chloroform, and four parts of alcohol, but does not specify the apparatus he employed for its use.

Green, of Boston, who employs ether in normal labour, gives it to light anæsthesia when the cervix is approaching full dilatation if the pressure of the head causes much pain. He then waits until the head is passing the perinæum, when ether is again given, at first lightly, but afterwards to full surgical anæsthesia.

Chenery (Boston) prefers chloroform in labour, as he believes it places the child in less danger, and is less prone to produce after-hæmorrhage.

Cottam (*Therap. Gaz.*, Nov., 1896) advocates the use of **sulphate of sparteine** as an antidote to chloroform syncope. He points out that fatal syncope sometimes occurs in the first stages of anæsthesia, in prolonged anæsthesia, or in anæsthesia when the patients are very feeble or debilitated. The pulse in these cases is rapid and of small volume, and alcohol, digitalis, and strychnine are not always capable of counteracting the depression. He injects $\frac{1}{10}$ gr. of sparteine hypodermically before the anæsthetic is given, and finds it lessens shock, stimulates the heart, and brings about rapid reaction.

Anæsthesia in cases of emergency operations for strangulation of the intestines, etc.

Spellissy reports the following case (*Annals of Surgery*, Feb., 1897, p. 183). A stout woman suffering from a strangulated hernia requiring operation had ether given her, "a few drops at a time." After taking about ℥j she vomited slightly as she was being lifted on to the table, became blue, and died. Laryngotomy was done, but the necropsy showed no vomit had entered the air-passages. The heart and kidneys were extensively diseased. **White**, commenting upon this case, believes the patient's death is merely coincidental with the anæsthetic, and he cites an example. **Hunt**, in recording a similar case, in which, however, a large quantity of vomited matter flowed from the stomach and entered the air passages, discusses the first course for lavage in such emergencies. Greig Smith (*Lancet*, vol. i., p. 582, 1892) laid down the law that when the stomach was distended with fluid anæsthesia should never be practised until the viscus was emptied artificially, or a local anæsthetic should be employed, and that the anæsthesia should only be continued so long as to allow of the incision into the parietes and the placing of the sutures. **Hunt** (*Lancet*, Sept. 25, 1897) recognises three ways of dealing with such cases: (1) To employ lavage, and so avoid the vomiting and risk of asphyxia and septic pneumonia. Against this method is the undoubted danger of collapse, which has been brought about even in a healthy subject when washing out the stomach had been practised without the use of an anæsthetic. (2) To avoid lavage and take the risk of the sucking in of vomit and fæcal matter. (3) To adopt a midway course (which commends itself to the author of this paper) and administer the anæsthetic, performing lavage before the operation is attempted.

Ernest Stokes, of Baltimore (*Annals of Surgery*, "Ante-Operative Asphyxia," 1897, p. 346) also deals with this subject. In two patients, the subjects of intestinal obstruction, chloroform was first given and well taken, then ether was substituted, and the

patient carefully lifted upon the operating table. When complete but not profound anæsthesia was produced the fæcal contents of the stomach were passively expelled from it, and entered the air-passages, in spite of all efforts, producing asphyxia. The relaxation caused by the anæsthetic was, it is surmised, the reason for the sudden and uncontrollable regurgitation of the fluid till then pent up under considerable pressure in the stomach. **McLane Tiffany** reports two cases in which he had the patients placed face downwards, thereby, he believes, saving their lives. Kussmaul (*Berl. klin. Woch.*, 1884) had successfully dealt with a case of an ileus by lavage. Stokes would trust to lavage and maintaining the patient in a raised posture so that his head was in a higher plane than his stomach. Trendelenburg's, or even the horizontal position, are most dangerous, as in them the over-distended stomach naturally empties itself on to the pharynx.

Keen, of Philadelphia, regards Trendelenburg's position as the safest for operations on the naso-pharynx. He places the patient with the head down at an angle of 35° to 45° to the horizon, and so, when the patient is anæsthetic and cannot clear his throat, the blood and other fluid, being unable to ascend, cannot enter the air-passages (*Annals of Surgery*, 1897, p. 97). A preliminary tracheotomy is thus avoided. He gives ether from an Allis's inhaler, but subsequently replaces this by chloroform, which is exhibited from a good-sized pledget of cotton held in ring forceps.

Rawlings Nichol (*N. Y. Med. Record*, Sept. 25, 1897) advises no food for eight hours before the chloroform, a saline purge overnight, and a warm-water clyster the morning of the operation. He passes a thread through the tongue to keep it from falling back. He prefers the dorsal or left-sided decubitus, and the early morning for operating. He emphasises the importance of maintaining the body temperature of patients who are put under ether. The importance of complete anæsthesia, especially under chloroform (*Therap. Gaz.*, Jan., 1897, Editorial) is dwelt on, and it is pointed out that "fear" is a potent factor making for danger during light anæsthesia. The irregular breathing of partial anæsthesia is another peril, as it is impossible to tell how much chloroform is being taken by the patient.

Action of chloroform upon the tissues.

Ajello, Milan (in *Monograph*, 1896; *Annals of Surgery*, March, 1897), has studied the urine carefully in 214 cases of chloroform narcosis. Albuminuria occurred in 80 per cent., and lasted two to six days. Age, severe illnesses—*e.g.* of heart and blood vessels, diabetes, and protracted or repeated anæsthesia. Neither sugar nor acetone was found. In 60 per cent. casts, mainly hyaline,

were found, but a few epithelial and granular. In four deaths (human) and twenty (dogs) he found all degrees of kidney trouble from hyperæmia and capillary hæmorrhage, to extensive coagulation necrosis of renal epithelium, and exudation into capsules. The livers showed fatty degeneration and necrosis. Loss of striation and fatty changes were seen in the muscles, while in the blood vessels fatty hyaline degeneration had taken place.

Willett (*St. Bart.'s Hosp. Reports*, vol. xxxii.) has noted for a year cases in which ether rash is developed. The eruption is roseolous, appears suddenly after three or four minutes, gradually disappearing after two more minutes. It is more common in women, and appears over the area supplied by the superficial cervical plexus. The appearance of a rash after chloroform is very rare. The nature of the operation and the age do not seem material factors in its causation.

H. A. Hare (*Therap. Gaz.*, Feb. 15, 1897), after careful research work, has come to the conclusion that death from chloroform is due to vasomotor depression. The arterioles have undergone dilatation, and so the blood drains rapidly through them from the arteries and heart into the large areas of blood vessels formed by the veins and capillaries. The patient is, in fact, bled to death, but into his own capillary areas. These areas are capable of containing many times all the blood which usually constitutes the circulation, as is shown by the fact that saline solution may be injected into the circulation in very large quantities without affecting the blood pressure. He quotes the experience of **Chisholm**, of Baltimore, and other American surgeons, which went to show that inversion, with compression of the floating ribs, during the performance of artificial respiration had many times saved life. Their proceeding would, of course, have the effect of forcing blood from the splanchnic areas into the thorax. The sitting posture favoured the deportation of blood from the brain into the splanchnic areas, and hence the frequent deaths when this posture was adopted. Hare advocates as measures to prevent chloroform death the giving of belladonna or atropine before the anæsthetic, and bandaging the limbs. Injecting saline solutions he thinks is valueless. The conclusions Hare comes to are: (1) the question of blood pressure is the most important; (2) the heart becomes affected. **Hare** (*Medical News*, New York, March 6, 1897) further enters into the way in which chloroform acts upon the various tissues. Its dominant action is depressing; coming in contact with the heart, even in medicinal doses, it weakens that organ. It lowers the vitality of the protoplasm of the respiratory centre to an extent proportional to the quantity

inhaled. Death, he believes, may occur from heart failure or respiratory failure, the latter being by far the more common. In the former case cardiac disease is present, either in the shape of a permanent lesion or as the result of engorgement or enlargement, the result of struggling. No doubt many such deaths occur with or without the use of chloroform. **Leonard Hill** (address before Society of Anæsthetists, *Brit. Med. Journ.*, April 17, 1897) discusses the pathological cause of chloroform syncope. The experiments instituted by the Hyderabad Commission he regards as open to adverse criticism on two counts: (1) because the experiments themselves were carelessly executed, and (2) the conclusions drawn from them are, in fact, in many cases the reverse of what the manometric and other tracings show. His own experiments (*Journ. of Physiology*, May, 1897, and vol. xviii., p. 15) demonstrate that paralysis of the respiratory centre depends on the chloroform in the circulation poisoning the respiratory centre, and upon the blood pressure. The higher the pressure the less is the failure of the respiration. The depth of the anæsthesia also depends upon the depth of the fall of blood pressure. He admits, however, that chloroform also acts upon and damages the respiratory centre, and so weakens the respiration, but insists that the respiration would not fail at the point it does unless the poisoning of the respiratory centre was associated with the fall of blood pressure, due also to the action of the chloroform. In all cases the posture of the patient plays an important part. The chloroform, by acting upon and depressing vasomotor action, allows the force of gravity to come into unrestrained play. In the feet-down position as in sitting, or in the semi-recumbent posture, the blood drains from the brain and thorax into the splanchnic system of veins, leaving the bulbar centres anæmic. His conclusions are: (1) Chloroform produces a primary failure of the circulating mechanism, and a secondary failure of the respiratory centre; (2) there are two kinds of chloroform syncope:—(*a*) During primary anæsthetisation; the patient struggles, holds his breath, raises the intra-thoracic pressure, congests his venous system, lowers his arterial tension, and finally takes deep inspirations and surcharges his lungs with chloroform. In the first stage his heart becomes impoverished, in the second suddenly filled. This supply is drawn from the lungs, and is overfilled with chloroform, passing through the coronaries to the muscle of the heart, paralytic dilatation takes place. (*b*) During prolonged anæsthetisation; this state of affairs arises from gradually giving chloroform to too great an extent. The horizontal posture and artificial respiration will resuscitate in

this (*b*) form of syncope. In the first (*a*) form the same measures should be adopted, and the heart rhythmically compressed by squeezing the thorax, and, failing success, the patient should be put in the feet-down posture in order to empty the engorged heart, then placed horizontally while artificial respiration is steadily kept up. This manœuvre can be repeated. Inversion and compression of the abdomen are said to be dangerous, as they tend to force more blood into the paralytically-distended heart. (3) Vagal inhibition does not take an important part in producing chloroform syncope. (4) "Ether is, in every way, a safer anæsthetic than chloroform." A writer in the *Therap. Gaz.* (July, 1897) points out the danger of lung and kidney disease following the lowering of temperature incident to the taking of an anæsthetic, amounting in some cases to 3° or 4°. **C. Allen** (*Amer. Journ. of Med. Sciences*) has made a similar research upon dogs, obtaining like results.

An important communication bearing upon the **effect which ether** has upon the **kidneys** has been made by **Lemoine** and **Gallois** (abstract in *Journal des Praticiens*, July 3; *New York Med. Journ.*, July 24, 1897). In the severest forms of uræmic respiratory disturbance, when actual (chronic) renal lesion is absent, repeated and large doses of ether given by the mouth and hypodermically invariably relieve the condition. Uræmia due to acute nephritis, acute renal congestion, renal congestion occurring in the course of sclerotic nephritis and of infectious forms of nephritis, is much benefited by ether. Chronic renal disease is not benefited by this treatment. The obvious corollary from this would seem to be that ether when inhaled, unless very enormous quantities are taken, is probably not injurious to the renal tissues, and is not likely to set up nephritis or cause uræmia. Lemoine and Gallois give 2 to 3 dr. every half-hour. An enormous quantity taken by the lungs would be required to correspond to this dose by the mouth. **J. B. Ogden** brought to the notice of the Boston Society of Medical Sciences the results of his research upon the **effect of ether upon the kidneys.** A very careful examination was made after ether was given in cases in which there was little or no pre-existing renal disturbance. Seventy-five cases were under observation, and were all of them those in which only a minor surgical operation had been performed and little or no blood had been lost, so that anæmia was not a disturbing factor. In 34·6 per cent. albumin was not present before, but was found afterwards. In 34·6 per cent. albumin was present before the etherisation, and was increased afterwards. Thus 69·2 per cent. of the cases showed albumin or an increase

of albumin after taking ether. In 1·54 per cent. albumin was neither found before nor after ether. In 1·33 per cent. albumin existent before was lessened after; and in 1·33 per cent., though albumin was detected before, none was found after ether was given; but these changes were probably due to the presence of blood corpuscles.

Albumin may, however, be present without any renal lesion, so Ogden relied for evidence of kidney disturbance not only on the appearance of albumin but also upon the presence of renal elements—casts, etc. In 14·6 per cent. casts were increased in number; in 57·3 per cent. casts were found after, not before, ether; so that in 71·9 per cent. renal disturbance, as shown by the presence of casts, was either initiated or increased after ether. In 22·6 per cent. no change in the quantity of casts was observed; in 5·3 per cent. casts were absent alike before and after; while in 22·6 per cent. more concentrated urine was voided after ether. It is suggested that the concentration of the urine may account for some of the hyperæmia and consequent renal disturbance. The profuse diaphoresis usually set up by ether may be the cause of the concentration of the urine. The quantity of ether given was 130 to 800 c.c., and the administrations varied from ten minutes to an hour and a half. The amount of ether inhaled, and the time the patient was under its influence, did not appear to bear any ratio to the amount of albumin. Children did not appear to suffer from ether albuminuria more than adults. In one case out of the seventy-five saccharuria developed after ether, and persisted three days. **Von Lerber** (*La Presse Médicale*, Nov. 11, 1896) examined the blood in 101 patients before and after etherisation. The hæmoglobin was found unchanged in sixty-five, increased in nineteen, and lessened in fourteen cases. He concludes, therefore, that ether produces little change. In fifty-five cases the red corpuscles were increased, in forty-two diminished, unchanged in four. It was also found that spectroscopy of the urine showed no increase of urobilin (eighty-three cases), as must have occurred had the corpuscles been damaged. In ninety-six cases the leucocytes were increased in number, in five decreased. This diminution was due apparently to conditions peculiar to the individual.

APPARATUS.

Bellamy Gardner's ether inhaler consists of a cylindrical reservoir containing 6 ounces of ether, surrounding a breathing chamber 2 inches in diameter (Fig. 1). A small metal shaft runs

vertically from the tap above through the breathing chamber, communicating below with the ether chamber. A hollow metal plug fits this shaft, and through a pinhole in the axis of the breathing chamber a fine stream of ether is directed upon the sponge, through which the patient breathes. The warmth of

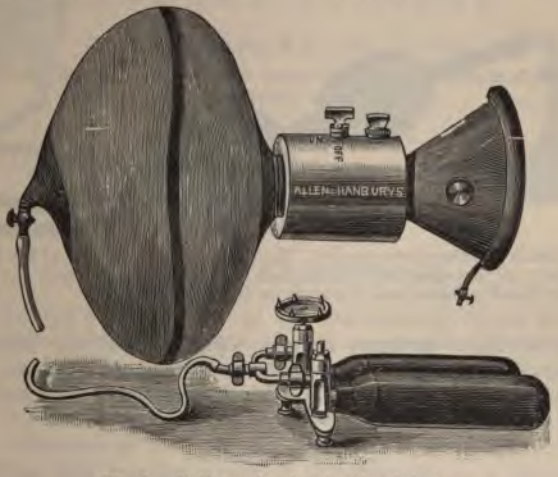

Fig. 1.—Bellamy Gardner's ether inhaler.

the hand of the administrator is sufficient to vaporise the contained ether, and the tension thus developed forces a stream of ether through the pinhole into the sponge. The special merit claimed for this inhaler is that it is light to hold, and produces efficient anæsthesia without causing cyanosis, pupillary dilatation, or distressing symptoms of any kind. The tube seen attached to the bag is for the use of nitrous oxide as a preliminary to the ether. It is claimed that this inhaler combines the advantages of the Clover's portable ether inhaler and Ormsby's instrument.

Hobday's chloroform inhalers.

These inhalers are intended to ensure a very high dilution of the anæsthetic. In one case (Fig. 2) the air is sucked in by the hand bellows, and passes over the surface of the anæsthetic, and is then presented to the patient. In the other and later form the air is pumped into the vessel containing the chloroform, and escapes along the affluent tube (Fig. 3). The principle is that of Junker, only in Hobday's inhaler the air tube does not pass down into the liquid. A very small percentage of vapour is in this way

ensured It is important to avoid tilting the bottle. In the lower animals the designer has found it safer than any other inhaler.

Fig. 2.—Hobday's chloroform inhaler. Showing the arrangement of the bellows whereby air is *sucked* over the surface of the anæsthetic and the mixed vapour steadily forced into the mask on the patient's face.

He reports (*The Veterinary Record*, Sept. 25, 1897) on 250 cases of dogs successfully anæsthetised by veterinary inhalers constructed on this principle. In the *Lancet* (July 24, 1897) he

Fig. 3.—Hobday's chloroform inhaler. Showing the arrangement of the bellows whereby air is *forced* over the surface of the anæsthetic and the mixed vapour thus steadily forced into the mask on the patient's face.

describes his inhaler as applied to human beings, and states that it is of especial value for children and persons for whom a very small dosage is considered advisable.

GENERAL SURGERY.

By William Rose, M.B., B.S., F.R.C.S.,

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I.—GENERAL METHODS.

Antistreptococcic serum as an immunising agent prior to operation.—One of the most valuable suggestions of the year is that when patients are exposed to the risk of sepsis after operation they should be previously rendered immune to the action of streptococci by the use of this serum. **Boucheron** was one of the first to call attention to this practice (*Annales d'Oculistique*, August, 1896); he was treating a case of lymphangitis in a diabetic by means of Marmorek's serum, and thought that the opportunity would be good for the removal of a cataract, which was also present in the same individual. Such cases are always liable to suppurate, but in this instance the recovery was satisfactorily uneventful. **Durham** (*Trans. R. Med.-Chi. Soc., London*, vol. lxxx., p. 191) also suggests that in cases of laparotomy, where the patient is liable to be infected with streptococci, it is a wise and rational proceeding to immunise them with antistreptococcic serum on the previous day; especially is this desirable when dealing with peritonitis or abscesses arising during the puerperium or after abortion. The most important communication on this subject was that of **Watson Cheyne** (*Practitioner*, April, 1897), who had utilised it as a preliminary measure before some extensive operations on the tongue and pharynx. In the first patient half the tongue had to be removed, together with the tonsil and anterior pillar of the fauces—just the type of case in which septic pneumonia is likely to develop. Two days before the operation 20 c.c. were injected, and on the following day 10 c.c. The progress of the case was remarkable; there was no elevation of temperature after the first twenty-four hours, with the exception

of a slight rise some days later, evidently in connection with the after-effects of the serum. There was no inflammation about the wound, no tendency whatever to any septic infection or septic pneumonia, and no sloughing of the surface of the wound. Cheyne explains this by the statement that the growth of streptococci induces the sloughing of the surface, and decomposition taking place in these sloughs causes the discharge to become offensive.' Similar results have occurred in other cases, and from our own subsequent experience we can fully confirm the benefits derived from this procedure. It usually suffices to inject about 30 or 40 c.c. in all, distributed over the preceding twenty-four hours, and, if need be, another 10 c.c. can be given after the operation. It sometimes induces a slight rise of temperature for a day or two, but this is not a matter of any serious moment. Another condition in which it might be desirable to utilise this prophylactic is in operating on joints, where streptococcal infection is very liable to follow in spite of every precaution.

Asepsis usque ad absurdum!—The latest development of the aseptic craze hails from Breslau, where **Mikulicz** now operates in gloves and with a wet towel tied over the lower half of his face, similar precautions being also insisted on for a period of three months for all his assistants (*Deut. med. Woch.*, June 24, 1897). Failure in maintaining asepsis in operation wounds is often attributed to the catgut, but, as Mikulicz points out, this can scarcely be the explanation in every case, since different results ensue though the catgut is taken from the same bottle. The hands are a much more likely source of contamination; even after cleansing with alcohol and sublimate the purification is only superficial, experiments having shown that the deeper parts often contain organisms. This point is interesting, as it emphasises the opinion always expressed by Lord Lister that carbolic acid is a more reliable agent for this purpose than sublimate, since it penetrates further into the tissues. The gloves used are simple white cotton gloves, known to the trade as "footmen's thin gloves"; a dozen pairs cost half a crown. They are sterilised, and one or more pairs may be needed during an operation according to the amount of bleeding, whilst, of course, they are changed if anything septic is touched; they can be used over and over again after washing. Necessarily, even when the gloves are used, the hands must first be thoroughly sterilised. After a little practice it is said that they do not in any way interfere with palpation, grasping, or sewing; in fact the seizing and retention of tissues is much easier with than without them. There is no object in using

them for operations where sepsis is certain to be present or to follow, as about the mouth, gullet, or rectum.

It has also been proved that even in quiet conversation bacteria are ejected in particles of saliva into the air around the speaker. Hence Mikulicz prohibits talking, but as it is impossible not to say a word sometimes, he and his assistants wear moist towels around their mouths and noses, including the beard if one is worn. Another point insisted on is that visitors should not be admitted to see operations without thorough preparation, and then only in limited numbers. The result of these precautions is said to have been most encouraging; in three months he has not had any inflammation in incisions which were completely closed, and hence has utterly discarded drainage for clean wounds which may be expected to heal by first intention. Stitch suppuration has also disappeared.

It is evident that the limitations introduced by following such a practice must be considerable, and Mikulicz himself admits that as all the conditions for aseptic surgery are difficult to fulfil, it is wiser for the general practitioner (and we would also add for the surgeon) to keep to antisepsis. One need only consult the statistics given on a later page as to the results of operations performed for the radical cure of hernia to see that there is little to be gained from such extravagant precautions.

II.—SURGERY OF THE OSSEOUS SYSTEM.

The treatment of fractures by the open method is coming more and more into favour, thanks to the impunity with which we can now deal with such conditions when antiseptic precautions are observed. A very thoughtful and suggestive paper is contributed by **O. H. Allis** (*Annals of Surgery*, June, 1897) to the Philadelphia Academy of Surgery, in which this subject is judiciously discussed. He points out the small amount of risk associated at the present day with the treatment of compound fractures. It is a matter of almost every-day occurrence for such lesions to be dealt with by immediate purification after laying the tissues freely open, fixation of the fragments by wires or pegs, and the application of a permanent dressing which may or may not need to be replaced, the whole lesion healing without the slightest difficulty or danger. Such proceedings have always brought to light the fact that there has been a much greater disturbance and injury inflicted on the parts than was at first anticipated, and the same may be assumed to hold good for fractures where the skin has remained intact; from this he argues, and with justice, that if an operation was

needed for the former where infection had possibly occurred through the lesion in the skin, it is equally required in many cases of the latter when reposition of the fragments is obtained with difficulty, since wound infection is practically out of the question. The distinction between the so-called *simple* and *compound* fractures ought scarcely to be insisted on at the present day, or, at any rate, the terms *open* and *closed* might be applied with more justice. A patient is told that he is suffering from a simple fracture, and yet at the end of six or eight weeks' discomfort and treatment he may be left with a deformed or useless limb, showing that the injury was of a most serious character and anything but simple.

Of course this contention is by no means novel, and in Great Britain **Lane** has been teaching the same doctrine for some years. He contributes a lecture to the *Clinical Journal* (July 7, 1897) in which he repeats many of the considerations he has already brought forward ; and from a more prolonged experience is able to recommend still more forcibly this line of treatment. He again points out that one of the chief hindrances to reduction of the deformity is extravasation of blood around the broken ends, and maintains that contraction or spasm of muscles has comparatively little influence since it can be easily eliminated by deep anæsthesia, and yet in spite of this the difficulty of securing complete apposition in closed fractures is very evident. He particularly insists on the necessity for operation in oblique fractures of the tibia and fibula, and in the different varieties of what is known as Pott's fracture. Illustrations of the drills, plated screws, and modified lion forceps used in these proceedings are given, as also skiagrams of the limbs showing the bones in perfect apposition with the screws *in situ*. Lane maintains that Pott's fracture cannot be reduced satisfactorily by the simple movements of extension and adduction of the foot ordinarily employed, and that the fibula should be cut down on in all cases, the fragments prised into position with elevators and screwed together ; when this has been accomplished the internal malleolus, even if at first separated from the end of the tibia by an interval, will usually lie in close contact with it. Lane's contention that the bone in a fracture ought to be restored to its original form is a perfectly just one, and the value of skiagraphy in determining whether or not this has been accomplished cannot be overrated. Naturally a considerable amount of opposition has been raised by these radical suggestions, but the old bugbear of surgeons, viz. the danger of converting a closed into an open fracture, is doomed, and there can be but little doubt that the younger generation will resort to this practice much more freely

than their ancestors, and the deleterious results which have so constantly followed this type of accident will, we hope, become a rarity. **Prof. Annandale**, of Edinburgh University (*Scottish Med. and Surg. Journ.*, Oct., 1897), recommends the use of steel pins for the fixation of bones, whether after operation, or for simple or compound fractures; they are made of different sizes so as to suit varying requirements, and are of good steel with rounded heads. For oblique fractures of the tibia he uses one or two pins passing through both fragments; in one case of ununited fracture, where it was difficult to drive the pin into position, he introduced one into the bone on each side of the gap, and then brought them, and at the same time the ends of the bone, securely together by means of a loop of wire introduced subcutaneously, its ends being twisted and brought out at the upper pin puncture. As a rule, the pins become loosened in from two to four weeks after their insertion, and can then be removed without trouble. **J. B. Roberts**, Professor of Surgery, Philadelphia (*Medical News*, Jan. 16, 1897), also maintains that complete reduction, exact restitution of contour, and perfect retention are the conditions of full success in the treatment of fractures. Skiagraphy has frequently demonstrated that fractures which were apparently reduced most satisfactorily have in reality a considerable amount of deformity persisting, and hence also advises recourse to operative proceedings.

The open treatment of fractured patella is still looked on askance by many, but it is gaining ground as the most certain means of securing perfect apposition and union of the fragments, and the fact that a surgeon of St. Bartholomew's Hospital has commended its use is very significant. **Butlin** in a clinical lecture (*St. Bart.'s Hosp. Journ.*, Aug., 1897) showed four cases on which he had operated in this way with complete success. The first operation for wiring a recent fracture of the patella in this hospital only dates back four years, and it is satisfactory intelligence to hear that the practice is being followed by others, and that in none of the open operations has any suppuration occurred. "In transverse fractures, in young and active subjects, or even in men under sixty years of age, who are in sound health, I wire the patella whenever the patient will permit it. . . . I do not think that wiring is so necessary in women, but there is no objection to it in good subjects." Butlin makes a semilunar incision, and uses two silver wires coming out of the fractured surfaces just short of the cartilages; he considers it a most important detail that no foreign body should remain in the joint. The limb is kept on a back splint for ten days, and a week later the patient is allowed to move the limb in bed, but in an elastic bandage.

He is usually discharged at the end of a month or five weeks from the operation, wearing an elastic bandage and walking slowly about. **Lucas-Championnière** (*Journ. de Méd. et de Chir.*, June 25, 1897) reports 50 cases operated on by the open method, and in no instance can any bad result be strictly attributed to it. One fat woman died of chloroform; one man of a kidney complication ten days after operation, but the articular lesion was in a most satisfactory condition; a third fatality was due to gout, but again the bone had united perfectly. A fourth case had been operated on many years previously, and the fragments approximated by silver wires, although they were not apposed; owing to a fresh accident the wires broke, and the lesion was reproduced; a colleague had opened the joint and suppuration ensued, which finally led to a fatal issue. Apart from these cases, of which the last should scarcely be included at all, the results were in every way satisfactory. The author alludes to the importance of removing all tags of fibrous tissue which are plastered down between the fragments, and maintains that if this is not accomplished osseous union cannot occur, in spite of the statements to the contrary by the advocates of subcutaneous operations. He turns up a large flap reaching nearly to the tibial spine, and employs two silver wires rather than one, each of them a millimetre in diameter. Drainage is always employed to secure the patient from pain and tension. It is not considered a point of much importance whether or not the cartilage is encroached on in the passage of the wires, as Lister originally maintained; the one great and essential desideratum is to obtain a secure hold of the fragments. When, therefore, the bone is very friable, or if several fragments exist, none of which would be likely to hold the wire securely, it will suffice to encircle the fragments by the wire. This is quite a different matter from encircling the bone without opening the joint; such a proceeding is of no value. No splints are applied, and movements are permitted from the earliest days. The solidity of the union is commented on in this paper, and Lucas-Championnière states that he has never had a case of refracture of the patella after wiring. Occasionally when the fragments have been merely approximated but not apposed, the wires have broken, and separation has again occurred; but the introduction of fresh and stronger wires has sufficed to give the patient control once more over the limb.

Lejars (*Presse Médic.*, March 20, 1897) relates his experience with what is termed "cerclage" of the patella, a proceeding that he considers simpler than wiring, and equally efficacious. He *opens the* joint after turning up a large semilunar flap, clears

away all clots and fibrous tags, and then passes a silver wire above through the tendon of the rectus, and below through the ligamentum patellæ, twisting the ends firmly together. The wire must pass close to the bone both above and below, and must be equidistant between the anterior and posterior surfaces, otherwise the fragments may be tilted slightly, and the cartilaginous apposition may not be perfect. The fragments are carefully wedged together by the fingers, the wire adapted closely to the inner border of the bone, and when it has been twisted upon the outer side, the patella should feel quite solid. Sutures are applied to the torn capsular and aponeurotic tissues on either side, the bursa patellæ, which is usually torn, is dissected out, and the wound closed. The limb is kept on a splint for twelve days, and a few days later movements and massage are commenced, so as to restore the functions of the quadriceps. Lejars has operated on six cases in this way during the last year, and has even dealt at one time with both patellæ, which had been broken simultaneously.

Treatment of ununited fractures by thyroid medication.—**Gauthier** (*Lyon Médical*, June 27 and July 11, 1897) writes a suggestive article dealing with this subject, and relates two cases in which thyroid treatment brought about the consolidation of ununited fractures. The influence of the thyroid secretion on the growth and nutrition of the tissues is well known; the association of myxœdema with cretinism has been frequently noted, and the value of thyroid extract in this condition has been conclusively established. Patients with exophthalmic goitre are sometimes affected with mollities ossium, and acromegaly is supposed to depend on an enlargement of the anterior lobe of the pituitary body, which is identical in structure with the thyroid. Experimental work has also demonstrated the same facts: thus rickets develops in the fœtuses of animals that have undergone total thyroidectomy during pregnancy (Trachewski); whilst von Eiselsberg removed the thyroid from two lambs, keeping another of the same age as a control. In the two former growth was very considerably affected, the head becoming flattened from before backwards, and the horns atrophying. The suggestion as to the use of thyroid extract in the treatment of ununited fractures was first made by Hanau and Steinlein at the Frankfort Congress in 1895, but apparently the two cases reported by Gauthier are the first in which it has been employed in practice. The first of these was a girl of fifteen, well developed, and with apparently no deficiency in the size of the thyroid body. She experienced a fracture of the lower third of the left femur, with overlapping of

the fragments, but with no appreciable or serious complication. It was easily reduced and put up in splints. At the end of a month perfect coaptation of the fragments was present, but not a trace of consolidation. The apparatus was reapplied, and phosphate of lime administered, but at the end of the second month her condition remained unaltered. The ends of the bone were well rubbed together, and blisters applied at the level of the fracture, but at the end of another month, *i.e.* 110 days from the accident, the fragments were still quite movable, and the parts tender on pressure. Thyroid medication was then commenced; a glycerine extract of the fresh gland was employed, an amount corresponding to 6 grammes of the organ being administered *per diem.* Although some general disturbance was at first caused, the treatment was persisted in. At the end of a fortnight considerable progress had been made in the consolidation of the fracture, and in six weeks from the commencement of the thyroid treatment the limb was firm enough to allow the patient to stand on it. The second case occurred in a man of forty-eight years, of apparently healthy constitution and with a normal thyroid. The upper third of the radius was broken by direct injury, and a light plaster support was applied to prevent rotary movements of the hand. At the end of three months no union had been obtained, and crepitus on movement of the part was distinct; the site of fracture was painful and swollen. Thyroid medication was adopted for twenty-five days, about 160 grms. of the active agent being absorbed. The crepitus had then entirely disappeared, the pain and swelling had gone, and the arm was nearly as strong as the other, although pronation and supination were a little limited. Certainly the account of these cases is both instructive and interesting, and since the treatment suggested is devoid of risk, it may well be utilised before resorting to other more serious means, such as operation.

The *closure of large osseous cavities* left after the removal of considerable masses of bone, whether for disease or accident, is always a somewhat tedious proceeding, owing to the rigidity of the walls and the want of vascularity of the tissues from which the granulation tissue has to be formed. One method of dealing with this condition is to allow the cavity to fill with blood clot and then wait for this to organise, whilst others have employed methods such as sponge-grafting. In all of these, however, the material which occupies the cavity merely acts as scaffolding on which the granulation tissue is built up, and the process of healing is always prolonged. **Ollier** (*Gaz. Méd. de Paris*, July 17 and 20, 1897) discusses various osteoplastic methods of com-

bating this condition. The tibia is the long bone which most often requires such treatment, and the os calcis is similarly troublesome after the removal of its interior for tuberculous disease. The plan Ollier recommends is to suppress or mobilise one of the walls of the cavity, so as, in the first place, to allow the periosteum to fall down and come into contact with the opposite bony wall, and in the latter to allow the two bony walls to be approximated. Of course when the whole of the osseous tissue is removed on one side, the strength of the bone is for a time diminished, but the new formation which occurs on the under side of the periosteal flap quickly restores it to a normal condition. This type of treatment is especially useful when a bone is thickened as a result of osteomyelitis. In dealing with a long bone, where a large cavity containing a sequestrum of considerable length is opened up, the best plan is to detach one side of the hollow freely by transverse cuts above and below and by a longitudinal incision through the base. The whole of one side of the sequestral cavity can thus be freed and displaced inwards, being secured to the other side by a metallic suture, and thus the space to be filled up with granulations is greatly diminished. In a few cases it is even possible to undertake this at the same time as the removal of the bone, but if there is any sepsis present, it is wiser to delay matters for awhile. Occasionally several flaps of varying size and shape are required in order to conform with the special peculiarities of the case. Osseous grafts obtained either from the neighbourhood or from outside may also be utilised in some circumstances. In Ollier's communication various cases illustrating the value of these suggestions are related.

Partial removal of the sternum for tumours.—Only within the last few years has this proceeding been undertaken, with any reasonable hope of success, and even now it is only justifiable to operate in picked cases. **Keen**, of Philadelphia, has recently recorded two instances in which he has succeeded in removing portions of this bone for tumours (*Med. and Surg. Reporter*, March 27, 1897), and appends to his account a summary of the other cases on record. In his first patient the inner third of the clavicle was involved, together with the upper left portion of the manubrium, whilst two nodules could be felt in the lower third of the sterno-mastoid on the same side. The disease was evidently sarcomatous in nature. The first step in the operation was to ascertain whether or not such adhesions existed behind as would render removal impossible. This was done through an incision above the sternal notch, the finger being worked downwards

sufficiently to make out that the posterior surface of the bone was free. The lower third of the sterno-mastoid was divided and removed, together with all the superficial tissues in front of the clavicle and sternum; the clavicle was divided at the junction of its inner and middle thirds, and the inner third removed entire. The first rib was next dealt with, a full inch of its anterior extremity, together with the cartilage, being freed and taken away. It was then possible to detach the manubrium from all its posterior connections, and to remove the diseased portion by horizontal and vertical incisions made with cutting pliers, the former at the junction of the manubrium and gladiolus, the latter just to the left of its right border. None of the vessels of the neck were laid bare, with the exception of the left jugular, although the pulsations of the aorta could be clearly detected. The patient did well although some suppuration occurred, and fifteen months afterwards there was no sign of recurrence. The second case was one of carcinoma secondary to scirrhus mammæ. The disease first appeared in the left breast, which, together with the axillary contents, was removed. Soon afterwards a swelling of the sternum was noticed at the junction of the manubrium and gladiolus, and following this a nodule was discovered in the right mamma. An attempt was made to remove the disease, and the breast, together with the second and third costal cartilages, the intercostal tissues down to the pleura, and a portion of the sternum were taken away. The patient recovered, but within a few months died of recurrence.

Keen has been able to collect 17 other cases of operation on the sternum for the removal of tumours, and of these 9 were sarcomata. He notes that fortunately adhesions to the posterior tissues are late in forming, and that therefore, if the case has not been neglected too long, operation is justifiable. Even should the tumour be adherent and the pleura opened during the operation, the result is not necessarily bad, since collapse of the lung does not invariably follow. The results of 18 of the above-mentioned cases are recorded, and of them only 4 died, a very excellent result when one considers the extent of some of the operations, which have included removal of the whole gladiolus. Details of the technique are given. **Carless** has also undertaken an operation for the removal of a huge sarcoma of the manubrium (*Med. Press*, October 6, 1897), but was unfortunately obliged to desist owing to the extent of the posterior adhesions, which could not be detected before division of the bones. He draws the conclusion that unilateral tumours are the most favourable to attack, since probably only one pleural cavity is likely to be opened if

they are at all adherent posteriorly. It is scarcely wise to risk the opening of both pleuræ at one time, although such has been done without a fatal issue, and therefore he recommends that tumours involving both sides of the manubrium should not be touched.

III.—SURGERY OF JOINTS.

The treatment of tuberculous arthritis.—When it was first proved that affections of joints which were formerly known as strumous were dependent for their incidence upon the bacillus tuberculosis, a considerable impulse was given to their treatment by surgical means, so as, if possible, to eradicate all traces of diseased tissue, and it was even taught that the great essential was to remove every portion as thoroughly as one does for malignant disease. The pendulum is now, however, tending to swing back in the opposite direction, and much more reliance is being placed on constitutional treatment and prolonged rest. In some cases this seems to be insufficient to bring about a cure either on account of the weakness of the individual or from the virulence of the organisms. In such cases where the surgeon does not wish to resort to operative measures, an important adjuvant is to be found in iodoform, which has been proved to have marked inhibitory influence upon the development of the specific bacillus, even if it is not actively germicidal. **Gilbert Barling** (*Treatment*, May 27, 1897) speaks with the utmost confidence of the benefit which can be derived from the injection into and around affected areas of an emulsion of this substance of glycerine (10 per cent.). He advises that the fluid should be sterilised immediately before use, although this is not absolutely essential. A syringe is employed capable of holding about 6 drachms, and must be taken to pieces and thoroughly boiled prior to use. The amount injected varies with the particular joint and the age of the patient; into the knee of a child five or six years old about 2 drachms is introduced, whilst an adult's knee will take about twice that amount. The immediate effect is to produce a good deal of effusion, leading to an increase of pain, swelling, and perhaps temperature for a few days. Where there is considerable thickening around the joint, injections into these pulpy masses may be practised, and then the amount of swelling and pain is not so great. Of course where deep bone lesions are present, the emulsion is of no good since it cannot reach them; but if only the articular extremities are affected, the emulsion is often sufficient to bring about a satisfactory result. Barling does not consider that such treatment acts by inducing sclerosis of the surrounding parts, since he

finds that no good follows similar injections of chloride of zinc. Of course, all cases do not improve under this *régime*, but even then no harm is apparently done by it. The injections may be repeated several times, but an interval of at least a fortnight is advisable. **Duplay** and **Cazin** (*Gazette des Hôp.*, Sept. 28, 1897) related to the Moscow Congress some experiences illustrating the point that the intra-articular injection of iodoform is most valuable in this affection. Formerly they had employed iodine for this purpose, but have now given it up in favour of iodoform, and prefer to use it suspended in mucilage rather than dissolved in ether, the latter causing too much pain. Of 9 patients treated in this way, 7 were cured in periods ranging from four to six months; the other 2, which were advanced cases, with sinuses already existent when treatment commenced, were unimproved. The 7 cures included 5 cases of disease of the knee joint; they have been watched since their discharge from the hospital, and no recurrence has been noted, in spite of the fact that when first seen it seemed impossible to deal with them, except by excision.

A number of interesting notices have appeared during the year concerning *the treatment of hip disease*, and to some of these we must draw attention.

In the first place a valuable discussion has arisen between **Tobin**, of Dublin, and **Howard Marsh** as to some of the principles which should govern us in the treatment of this affection (see *Brit. Med. Journ.*, April 24, May 8 and 29, and Aug. 14, 1897). In the causative communication Tobin suggested the early performance of a sub-trochanteric osteotomy of the femur in order to remedy the deformity of the limb. He argued that the position of greatest ease for the joint, viz., flexion, abduction, and eversion, is one of great awkwardness for the limb, and that the means taken to correct this deformity are unsatisfactory. Thus after causing the limb to assume this attitude by injection of fluid into the joint, he forcibly straightened it and caused the fluid to be squirted out again forcibly. It is therefore assumed that any method, whereby extension is obtained, will exaggerate the symptoms of tension, and therefore the application of a weight and pulley is objectionable, since it is usually applied with the limb straight. He also maintains that a considerable proportion of the cases in which flexion has been treated by extension with weight and pulley go on to suppuration, quoting in support of this view some old figures (which still remain in Erichsen) dealing with results obtained at the Alexandra Hip Hospital twenty or more years ago; his

explanation of this fact is that extension can never give the joint absolute rest, and inasmuch as Nature flexes the limb, he thinks it right to attempt to meet the difficulty without disturbing the false position of the head of the bone. Once more he claims that the section of the femur is itself beneficial, since it reduces the amount of vascular tension in the bone. Marsh has but little difficulty in meeting each and all of these points and shows that osteotomy is quite superfluous. Thus he first states a fact that must be abundantly obvious, viz., that the position of the joint is not dependent on an increase in the fluid contents, but is assumed in order to relax the tense and swollen articular tissues, and hence the restoration of the limb to a correct position cannot increase the pain in the way that Tobin suggests. The application of extension in an incorrect manner is admittedly capable of increasing the pain; thus if the weight is applied to the flexed limb lying flat upon the bed, the only result is to tilt the pelvis forwards, producing thereby lordosis, and increasing the interosseous pressure. This can be obviated by making extension with the limb flexed into the attitude of ease; by this means muscular spasm is diminished quickly, and the limb falls naturally into the desired attitude in a short time. A Thomas's splint can bring about the same result if it is applied with the limb suitably flexed at first. As to suppuration being more common when extension has been adopted, Marsh states that the later reports (not quoted or mentioned in Erichsen or by Tobin) show that of the cases treated at the Hip Hospital only 15 per cent. suppurate. The last advantage claimed by Tobin for his method of sub-trochanteric osteotomy, viz., the relief of osseous tension, is certainly a novelty, but the evidence adduced as to its possibility and value can scarcely be called sufficient. The outcome of this interesting discussion is to emphasise again the principles relating to the treatment of early hip disease, and especially that connected with the direction in which extension can be best and most safely employed.

The treatment of this affection has also been discussed at some length in the Paris Société de Chirurgie (*Gaz. Méd. de Paris*, April 10, May 29, June 5 and 12, 1897). **Ménard**, of Berck-sur-Mer, who has charge of a hospital close to the sea, dealt with his method of treating the abscesses consecutive to this trouble; if they are unopened, and therefore aseptic, the majority of them can be cured by injections of camphorated naphthol, 2 to 10 injections being required at intervals of from ten to fifteen days. In 7 out of 55 cases treated in this way the abscesses did not entirely disappear, although they diminished in size, and for such he

recommends excision. The abscess should be opened, the fistulous track into the joint followed and scraped, the head of the bone removed, and the acetabulum thoroughly curetted; the whole wound is then well washed out with hot sterilised or sublimated water, and the wound closed without drainage; in only one case has he failed in obtaining primary union. **Kirmisson** took a wider view of the subject, and described his method of treatment in the different stages. In the early pre-suppurative stage he prefers total immobilisation by plaster, splints, etc., to prolonged extension, since by the former the child is not debarred from taking exercise in the fresh air. He also draws attention to the fallacy of making extension with the limb apparently straight in consequence of an associated lordosis. Should the limb be in a bad position to start with, it is most essential that no forcible reposition be attempted, as thereby diffusion of tuberculous material may occur throughout the body, and a fatal issue by tuberculous meningitis, or some similar complication, be the result. In five cases he has seen mishaps of this nature following, and presumably due to, such treatment. We are delighted to see this warning given by so capable an authority; the dangers of careless manipulation of tuberculous foci have several times lately been brought before our notice; in particular we would allude to the importance of gentleness in handling tuberculous glands during their removal; undue compression is, without doubt, liable to lead to dissemination of the virus. With the exercise of care and patience these tuberculous foci can usually be removed by a clean process of dissection rather than by rough handling and traction. The reduction of the deformity in hip disease should be made slowly, and if continued extension fails, section of tendons may be undertaken, or even in the worst cases (according to Kirmisson) sub-trochanteric osteotomy. In the second stage of suppuration Kirmisson recommends the injection of an etherial solution of iodoform after partial evacuation of the pus; the injections, however, should not be made too frequently, but sufficient intervals allowed to elapse between them. In the last stage of the disease excision is required, but it is unnecessary to follow up and extract every particle of tuberculous granulation tissue; if the general health is satisfactory, Nature can deal with the portions that may be left behind. **Broca** fully agreed that conservative treatment is the correct line to follow, but considers that prolonged extension is better than simple immobilisation. He, too, treats abscesses by injection of an etherial solution of iodoform, and reserves excision for the later stages; he thinks it hopeless and unwise to attempt union of the wound without drainage.

Townsend, of New York (*Medical News*, June 26, 1897), discusses the question of excision of the hip, and relates the experience gained at the Hospital for Ruptured and Crippled during the years 1888 to 1896, during which period 2,295 patients were treated for hip disease, of whom 119 were subjected to excision. The operation was resorted to only as a last resource when other methods of treatment had apparently failed, and when it seemed certain that unless some operation were undertaken death would inevitably follow. Abscesses or sinuses, more often septic than otherwise, were present in 113 out of the 119 cases. The results have been traced in 99 patients, and of these 52 are dead, all but one dying as the result of the disease; in the majority of cases the fatal event was more due to sepsis than to tuberculosis. Of the 46 known to be living 26 alone are cured, and a considerable proportion of the remaining 20 are likely to die from exhaustion. In 24 cases the anterior operation was employed, and in the remainder the posterior, although necessarily no typical operation could be utilised owing to the presence of sinuses.

The outcome of these different communications tends to prove that there is now a greater reliance placed on conservative measures than on operative, and that excision is being relegated to the position of a *dernier ressort*. Whether this is entirely wise is a question that is open to discussion. Necessarily the type of patient that one has to deal with and the surroundings have a considerable influence both on the evolution of the disease and on the practice of the surgeon. If a patient's environment is good and sanitary, and if prolonged rest in such circumstances can be maintained, conservative measures may well be relied on and excision will be seldom needed; but when one is dealing with slum children of poor physique and hopelessly unhygienic surroundings, an early excision is more frequently required, though it should never be undertaken until it has been demonstrated that conservative measures are a failure, or unless the disease has progressed too far for recovery by such means to be expected. Our usual practice in dealing with hospital patients is as follows: In the early pre-suppurative stage the child is kept in bed, and usually with extension applied until the pain and tenderness have disappeared, when a Thomas's splint is fitted on and the child allowed to get about. If there is no great amount of deformity the extension is put on with the limb lying flat on the bed, and though at first a little lordosis may be present, it soon disappears as the spasm of the muscles ceases; when, however, there is a considerable degree of flexion the extension is made in the direction of the limb, which is gradually brought

down into the correct posture. If this treatment fails to relieve the pain and the patient is evidently losing ground, or if an abscess appears, an incision is made into the articulation usually from the front, and if considered necessary the head of the bone is removed and the acetabulum curetted. Our experience has almost always been that there is much more disease present than we had anticipated, and we have rarely regretted undertaking the operation. In the later stages where sinuses exist, or an abscess is pointing in the gluteal region, the posterior operation seems to be more suitable. Drainage is almost always employed, and preferably by means of a gauze plug infiltrated with an emulsion of iodoform. In the great majority of cases these children do extremely well, the wounds soon healing, and a fair amount of mobility being secured; of course the limb is immobilised in a Thomas's splint for some months after cicatrisation is complete.

Bardenheuer (*Centr. für Chir.*, Feb. 20, 1897) has recently undertaken the somewhat heroic operation of removing the leg and half the pelvis for extensive tuberculous disease of the pelvic bones as a consequence of hip disease. The patient was a woman aged 46, who had been the subject of coxitis from quite early years, the leg being atrophied and crutches always employed. Several septic sinuses existed, and the phenomena of amyloid disease were becoming urgent. The leg was much flexed and internally rotated, and the trochanter was 15 cms. above Nélaton's line. Flaps were fashioned from both the inner and outer aspects of the limb, and connected by an oblique incision along Poupart's ligament. The peritoneum was freed from the ilio-psoas, and the vessels traced up high enough to enable both external and internal iliac arteries and veins to be tied and divided. The thigh was then removed at the hip-joint with scarcely any bleeding, and subsequently the innominate bone was taken away. The horizontal ramus of the pubes was sawn across close to the symphysis, and the descending ramus of the ischium divided. The ilio-psoas was separated from the underlying tissues, and the muscles inserted into the crista ilii cut across. The innominate bone was then dragged outwards and forcibly detached from the sacro-iliac synchondrosis. The psoas was stitched across to the remains of the adductor tendons and muscles, and the wound closed after provision had been made for drainage. The patient suffered but little from shock, and made an uneventful recovery. **Wolff**, who reports the case, lays great stress upon the preliminary ligature of both the iliac vessels, and also upon the absence of chiselling, which seems so often to determine a considerable

amount of shock. He thinks it would be wise in another similar operation to retain the glutei muscles, at any rate in part, so as to form a more satisfactory covering to the peritoneum behind. Of course such a procedure as this can only be called for under very exceptional circumstances; the maximum that is usually required even in cases where there is a certain amount of pelvic disease, associated with septic sinuses of the hip, is an amputation through the hip joint, to which may subsequently be added curetting of the pelvic bones.

IV.—SURGERY OF THE VASCULAR SYSTEM.

Wounds of the heart and pericardium.—Since the publication of Capellen's case of successful suture of a wound in the heart a considerable amount of attention has been directed to this subject, and a number of cases, the majority of them attended with fatal results, have been published. **Rehn**, of Frankfort-on-Main, called attention to it in a paper read at the German Surgical Congress (*Centr. f. Chirurg.*, App. to No. 28, 1897, p. 456), and gave a number of interesting general facts connected with the subject. Puncture of the heart leads to a momentary arrest, followed by irregular and tumultuous action. Small wounds gape but little, larger ones considerably, although this is influenced by the direction of the incision. Medium-sized wounds of the right ventricle always bleed more than those of the left. In small wounds the bleeding stops spontaneously after a time, but secondary hæmorrhage is very likely to follow; in larger wounds death is due to arrest of the heart owing to the intrapericardial tension. The value of suture is emphasised, and Rehn is able to report a case in which he had successfully accomplished it. A young gardener, aged twenty-two years, wounded in the fourth left intercostal space, was taken to hospital blanched and almost pulseless from loss of blood. He rallied after a time, but suffered severely from dyspnœa owing to the amount of intrathoracic extravasation. The fifth rib was partially resected, and after clearing away all the clot a small incision into the pericardium came into view, from which venous blood was escaping. On enlarging this aperture and exposing the heart, it was found that during diastole an incision a centimetre and a half in length became evident in the centre of the right ventricle. Three silk stitches were inserted and the bleeding was at once controlled. Owing to the rolling movements of the heart it was only possible to introduce the needle during diastole, since the systole caused the right ventricle to disappear behind

the sternum. It was interesting to note that the heart tolerated well the pressure of the fingers in order to control the bleeding, but that each prick of the needle and the traction of the suture led to a momentary cessation of action. The patient finally did well, although the after-treatment was prolonged considerably owing to pneumothorax and the persistence of a purulent discharge.

There has been some discussion during the year as to the best method of *exposing the pericardium* so as to deal with wounds either of that membrane or of the heart, or for purposes of drainage in suppurative pericarditis. Several authors favour the turning up of a trap-door consisting of the fourth and fifth costal cartilages and connecting soft parts, using the tissues of the third interspace as a hinge. The internal mammary vessels and left pleura are thus exposed and pushed to the left, so that the pericardium is left uncovered and accessible to operation. (*See* **J. B. Roberts**, and **H. Williams**, New York *Med. Record*, March 27, 1897.)

End-to-end union of arteries.—In the last edition of the "Year-Book" we noted some work which had been undertaken in this direction, and reported one or two cases of arterial suture. A further communication on this subject has been published by **J. B. Murphy**, of Chicago (*Medical Record*, Jan. 16, 1897), who has experimented largely on animals, and relates two successful cases. The method of union which he recommends is different from that suggested by Jaboulay, consisting in invagination of one end into the other. Three doubled-needled silk sutures are employed for the purpose, each needle being inserted from without inwards through the intussusceptum, so that a loop is left externally, and then from within outwards through the intussuscipiens. About one-third of an inch of the upper end is invaginated by this means. It is also advised that the threads should not pass through the whole thickness of the wall in the upper end, but just miss the tunica intima, so that no portion of the suture should be exposed within the lumen of the vessel, as otherwise it might determine thrombosis. In order to facilitate this invagination, a small incision parallel to the long axis is made in the lower end, extending for about a third of an inch from the site of section. Four or five interrupted stitches are then inserted into the intussuscipiens, binding it to the surface of the intussusceptum, the suture in the latter entering only the adventitia and media. A large surface contact of vessel is thus secured, and the arterial blood pressure tends still further to approximate the walls together and prevent hæmorrhage. The

results of Murphy's experimental work were on the whole satisfactory, but great care and delicacy are needed in handling the parts, and failures occurred in a certain proportion of cases.

As to the value and utility of this proceeding in man, Murphy points out that it is never needed in cases where the unassisted collateral circulation may be expected to keep alive the parts supplied by the divided artery. "We are called upon to suture arteries and veins only in cases in which, by their obliteration, there would probably be a necrosis or impairment of the vitality of the tissue supplied by them to such an extent that its normal functions would not be performed. Therefore, in the upper extremities we shall not be concerned with the arteries below the brachial; in the neck not above the common carotid; in the abdomen we are concerned with injuries to the aorta, renal, splenic, hepatic, and iliac vessels. Suture of the portal vein is particularly desirable, as in President Carnot's case. The greatest need for arterial suture exists after injury to the so-called terminal vessels, but they are the least accessible." In discussing the extent to which an artery can be safely cut away, Murphy says: "I cannot believe that a vessel can be repaired with safety when more than three-fourths of an inch is removed, except possibly in the popliteal space, Scarpa's triangle, or in the axillary space, where the position of the limb can be made to relieve the tension of the vessel."

Longitudinal wounds of arteries or veins are more easily dealt with, and Murphy agrees with the opinions formerly published by Jassinowski in Langenbeck's *Archiv* in 1891. Fine twisted silk is the best material to employ, and the sutures should merely penetrate the tunica adventitia and media, the intima being avoided. The sutures are inserted every one-sixteenth or one-twentieth of an inch, are interrupted, and should enter the vessel one-sixteenth of an inch from the margin of the wound. The ordinary double knot must be used, but not too firmly tied.

For partial circular wounds of an artery, it is recommended that if the lesion involves more than one-half of the circumference the edges should not be united end to end, but the injured portion should be resected, and the divided segments treated by invagination.

In illustration of his remarks, Murphy reports two interesting cases of injuries to vessels dealt with by suture. In the first the patient received a bullet wound in Scarpa's triangle, and on dissection it was found that the internal saphena vein was per-

forated back and front, the bullet having passed through its middle; both openings were closed by silk sutures. A similar perforation existed in the common femoral vein, just above its junction with the profunda, and it was necessary to tie this latter trunk before the openings in the main vessels could be secured. The femoral artery had a fragment of tissue torn from the side of its sheath, but the vessel wall was apparently uninjured. After the compresses had been removed not a drop of blood escaped from either vein. There was some inflammatory reaction, but the patient did fairly well, until nearly a month had elapsed, when bleeding occurred from a sinus which had remained unhealed, and a tumour of some size developed in the upper part of the thigh. This was opened up, and on removing a large clot bright red blood escaped *per saltum* from the bottom of the wound. On compressing the external iliac, it was found that the inner wall of the artery had been eroded for the space of an inch, and that several perforations were present. It was carefully dissected out and an inch and a half of the trunk was resected, ligatures being applied both above and below. The case then ran an uninterrupted course towards recovery. In the second case the bullet entered the groin just below Poupart's ligament. There was but little hæmorrhage; a few days later a slight swelling developed, in which a very loud bruit could be heard, and the pulsation in the distal vessels of the limb was considerably diminished. An incision five inches in length was made in the course of the vessels, and the femoral artery was readily discovered. Clamps were applied to the trunk above and below, and bleeding from a wound in the vein controlled by digital compression. A small aneurysmal sac was thus exposed, arising from a perforating wound of the artery, which involved both anterior and posterior walls; in fact, only about one-eighth of an inch of the wall was intact on the outer side of the perforation, and a sixteenth of an inch on the inner side. The vein was also torn at one spot, and this was first dealt with by suture after controlling the circulation in it, as well as in the profunda vein. On releasing the clamps it dilated owing to the blood pressure, but was only about one-third of the normal size; there was no bleeding from it. The opening in the artery was then examined and found to be about three-eighths of an inch long; one-half inch of the vessel was resected, and the proximal end invaginated into the distal for a third of an inch with four double-needled threads. The adventitia was peeled off the invaginated portion for a distance of a third of an inch; a row of sutures was placed around the edge of the overlapping

distal portion, the sutures only penetrating the media of the proximal portion; the adventitia was then drawn over the line of union and sutured. On removing the clamps no blood escaped, and pulsation was at once restored in the vessel below the union. The wound suppurated, but the patient did well and recovered without œdema or any circulatory disturbance. Of course sufficient time has not yet elapsed to enable us to come to any final conclusion as to the value of this method of treatment, and it will be interesting to hear later on whether or not any aneurysmal development occurs; but at any rate Murphy is to be congratulated on his success.

Schwartz (*Gaz. des Hôpitaux*, Dec. 3, 1896) relates a somewhat similar case in which he treated a tear of the lateral sinus by suture. The case was that of a coachman who had been kicked by a horse behind the left ear, producing a depressed fracture. Various cerebral symptoms resulted and for these trephining was considered necessary. During the operation a portion of bone adherent to the dura mater had to be extracted, and in spite of every precaution the lateral sinus was torn to the extent of about a centimetre. A finger placed on the sinus controlled the bleeding, and it was then found that the lesion could be secured without much difficulty by suture. Such an observation is valuable, since the sinus is not uncommonly exposed to injury during operations on the mastoid, and it is certainly desirable to control the bleeding without having recourse to plugging, whereby thrombosis is almost certainly induced.

Orlow (Ref. in *Centr. für Chir.*, May 29, 1897, No. 19) relates a case in which he made an incision in the popliteal artery during an operation, the wound being from a half to three-quarters of a centimetre long. He stitched it up by means of three stitches inserted through the whole thickness of the walls, and two over-stitches including merely the adventitia and surrounding connective tissues. In three days distinct pulsation was noticed in the vessels of the leg. Later on the limb required amputation, and it was then found that the artery, though narrowed, at the site of suture, was quite pervious.

Treatment of aneurysms.—A number of interesting cases have been published during the year which serve to illustrate some of the more recent ideas as to the way in which aneurysms can best be dealt with.

D. D. Stewart, of Philadelphia (*Brit. Med. Journ.*, Aug. 14, 1897) reports the necropsy on a case of *innominate aneurysm* of large size, completely cured by the employment of electrolysis through 10 feet of snarled, coiled, fine gold wire, introduced into

the sac; the patient lived three and a half years after treatment, and died of cerebral thrombosis. On *post-mortem* examination it was found that the aorta was dilated in a fusiform manner from its commencement to the left subclavian trunk, whilst the innominate aneurysm was represented by a firm fibroid tumour about the size of a fœtal head, 13 cm. long by 9 cm. wide; the mass consisted of organised fibrin in the midst of which was found the coiled-up mass of gold wire. The author states that he has now treated two cases of sacculated aneurysm by electrolysis through coiled gold wire and has directed the treatment of another case; the results, at any rate in the two last cases, have been most gratifying. Gold or silver wire should be employed, after being carefully drawn so that it can pass without difficulty through an insulated hollow needle. The most complete antiseptic precautions are called for, and then the needle is inserted in a valvular manner by drawing the skin aside. The amount of wire introduced varies with the size of the sac, but Stewart states that for a globular aneurysm of 3 inches diameter 3 to 5 feet are sufficient, whilst for one 4 or 5 inches in diameter 8 or 10 feet are required. The positive pole of the battery should be attached to the wire, and the negative pole to an electrode placed on the back or abdomen. The current is very gradually increased in strength up to about 60 or 80 milliampères, and then slowly diminished; the application should last about three-quarters of an hour or more. The battery is then disconnected, the needle gently withdrawn, and the wire cut off short and pushed back beneath the skin, the valvular opening in which tends to cover it completely. By this means a large extent of surface is exposed to coagulation, and should the wires touch the sac wall so much the better, as thereby changes are induced which lead to subsequent proliferation of the endothelial or connective tissue elements. Ten cases are mentioned as having been treated in this way, and certainly in four of them prompt coagulation of the contents of the sac occurred with consolidation of the tumour. There can be but little doubt that this plan of procedure is an improvement on either that of simple needling as proposed by Macewen, or of electrolysis by means of a couple of needles, or of the simple introduction of wire. Several of the cases were totally beyond the hope of cure by any other method of treatment.

Subclavian aneurysm.—**Clutton** (*Medico-Chi. Trans.*, vol. lxxx., p. 371) relates a case in which he cured an aneurysm involving the third part of this vessel by ligature of the first part of the subclavian artery. The aneurysm was of three years' duration,

and about as large as a walnut, reaching from the scalenus anticus to the clavicle. At the first operation (Fig. 1) the trunk was tied at the junction of the first and second parts after the scalenus had been divided; the superior intercostal was also ligatured. The material employed as a ligature was gold-beater's skin, which had been specially prepared by Ballance; it was tied in a stay knot, sufficient force being used to stop the pulsation beyond, but not

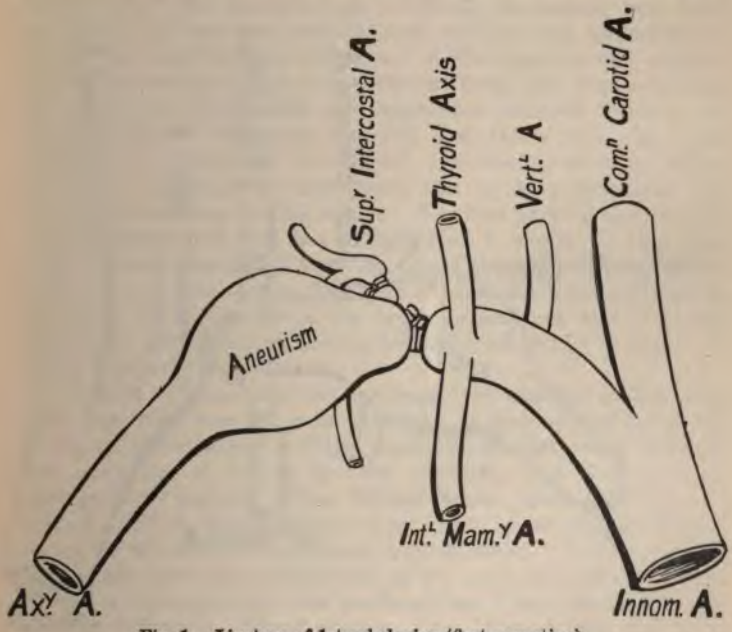

Fig. 1.—Ligature of 1st subclavian (first operation).

to divide the coats. The wound did well although there was a little superficial suppuration, but the pulsation returned in the aneurysm, which in the course of eight or ten weeks was as large as before, and pulsating with equal force. A second operation (Fig. 2) was therefore undertaken in order to secure the artery on the proximal side of the former ligature. A curved incision was made above the clavicle, the outer fibres of the sterno-mastoid were divided, as also the origins of the sterno-hyoid and -thyroid. The carotid artery and jugular vein were now seen lying side by side in the centre of the wound, and after a little careful dissection

the former was drawn inwards together with the pneumogastric, and the latter outwards with the phrenic nerve. The vertebral vein had to be divided to give access to the subclavian trunk, which was then secured without much difficulty; the ligature was applied on the proximal side of the internal mammary and thyroid axis, which were also tied. The wound healed satisfactorily, but in a week's time it was found that pulsation was

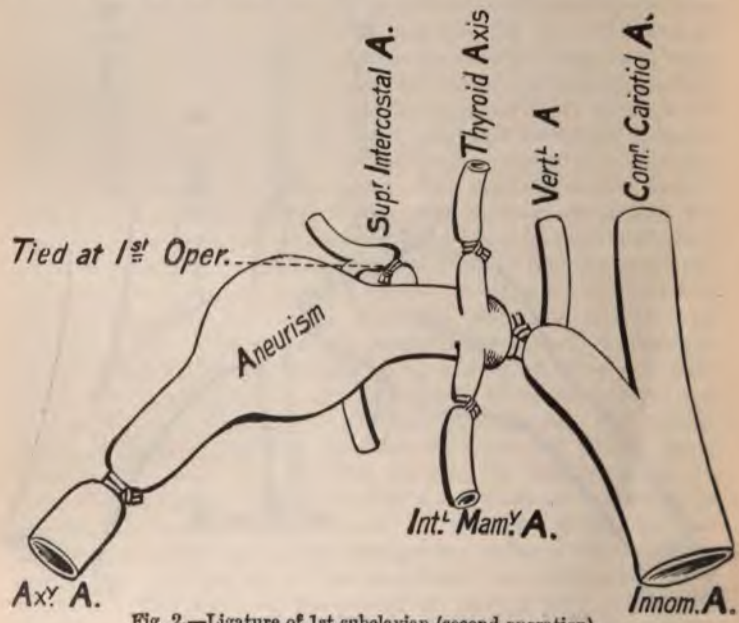

Fig. 2.—Ligature of 1st subclavian (second operation).

still present, and therefore the first part of the axillary was ligated. The pulsations then finally ceased, and the sac gradually diminished in size. Silk was the material employed for securing the first part of the trunk, tied as before in a stay knot, and without attempting to divide the coats. Clutton considers that if the inner tunics are divided, the blood pressure in the neck is sufficiently great to determine the formation of an aneurysm at the site of ligature. The successful issue of the case may be attributed to two factors: the aseptic condition of the wound and the tying of the internal mammary and thyroid axis, by which any

backwash of blood was prevented. The latter point is a most important one, and is recognised as an essential detail in securing other large vessels, such as the innominate, hæmorrhage almost always occurring unless the carotid and also sometimes the vertebral are tied at the same time.

In the discussion that ensued on this case **Bernard Pitts** related a somewhat similar case in which he had tied the first part of the artery for an aneurysm involving the second and third portions; the sac was here so large that it was impossible to secure the neighbouring branches. A silk ligature was applied, and it was thought that only sufficient force had been employed to bring the vessel walls into apposition without dividing the tunica intima. Pulsation recurred, and the wound was again explored by Ballance, who found a pulsating swelling which seemed to spring from the aorta, and entirely precluded any further proceedings in this region. The first part of the axillary was therefore tied, but the patient died a month or two later from diffuse hæmorrhage from the site of the exploration. It was found *post mortem* that an aneurysm of some size had developed at the point of application of the first ligature, and was evidently due to the tunica intima having been divided owing to the walls being soft and atheromatous.

In both of these cases the aneurysm was situated on the right side, and there was no great difficulty in finding and tying the first part of the vessel. When, however, the left side is affected, the condition of affairs is very different, and the operation becomes very serious. Thus **Mitchell Banks** (*Brit. Med. Journ.*, Feb. 6, 1897, p. 335) relates a case where he attempted it and, owing to the difficulties present, had to desist. A long incision was made down the middle line of the neck, and at either end of this a transverse cut was made so that a flap was formed and thrown outwards. The clavicle was cut through and the inner third removed, a piece of the first rib excised, the internal jugular and innominate veins were tied, and the left subclavian vein, which caused some trouble, was plugged with cyanide gauze. The aneurysm did not pulsate much, and this want of pulsation increased the difficulty of finding the artery. During the prolonged operation the left pleura was accidentally opened and stuffed with gauze. It was at last deemed necessary, on account of the condition of the patient, to desist from further attempts to find the vessel. The patient died seventeen days later from pleurisy.

Carotid aneurysm.—**Delagenière** (*Archives Prov. de Chir.*, 1896, p. 225) recommends extirpation in dealing with primitive

aneurysms of this trunk as safer than simple ligature of the cartoid, owing to the diminished risk of setting free emboli. The value of this proceeding for aneurysms of the extremities has of late been frequently noticed, but its extension to large vessels of the trunk or neck has not hitherto been attempted. The author recommends that in order to prevent venous bleeding it is advisable to divide the internal jugular between ligatures. The artery is clamped below the sac, and then tied and divided immediately below the clamp. The sac can thus be lifted up, any vessels arising from it secured, and the posterior wall freed from its connections. The greatest care has to be taken not to injure the pneumogastric and sympathetic chain. He relates a successful case which he treated in this way in a girl sixteen years of age who had been stabbed in the neck nine months previously; the aneurysm was as large as an orange.

Cirsoid aneurysm.—Two cases of this rare affection have been recorded during the past year. In the first, treated by **Beaumont** (*Brit. Med. Journ.*, July 31, 1897) the patient, a servant girl of twenty-two, complained of a pulsating tumour on the left side of the forehead, running up from the inner angle of the orbit, and covering the left side of the frontal bone. Strongly pulsating nutrient vessels were traced into it from the occipital, temporal, and angular arteries of the same side, whilst others reached it from across the middle line. As the condition was progressing, surgical treatment was undertaken. This consisted in the first place in tying all the main nutrient vessels; each was cut down on individually and secured, before they became dilated, and in this way eight arteries were secured. The thrill and pulsation were thus very much diminished. The next step was to insert subcutaneously and in an opposite direction to each other two needles, with an exposed surface of about an inch, into the anterior and outer part of the tumour. An electric current of 100 milliampères was passed for ten minutes, and then, after gradually diminishing it, the needles were withdrawn; each of the four segments of the tumour was dealt with in the same way, ten minutes' electrolysis with a current of 100 milliampères being allowed for each. It was then found that all parts of the mass were harder, that its resiliency was less, and that pulsation could scarcely be felt. A week later two fresh vessels were detected at the postero-external portion, and these in turn were tied, and electrolysis was once more employed. The final result was most satisfactory, the whole mass, which originally measured *7 inches by 5,* being consolidated. Nothing was done directly to

the orbital portion, but it partook of the general benefit, due probably to the starvation resulting from distal obstruction, the shrinkage being sufficient to allow the eye to return to its usual situation in the orbit. The second case was reported by **Summers, jun.** (*Annals of Surgery*, May, 1897, p. 620); it occurred in a man aged forty-five, and occupied the forehead, but without encroaching on the orbit. The chief nutrient vessels were first of all ligatured, and then a large horse-shoe incision was made with the base upwards, and the whole growth excised. The operation was a bloody one, as several vessels entered the mass which had not been formerly noticed. The outer wall of the skull was found to have been absorbed, and there was a free anastomosis with the diploic vessels. The wound healed entirely, but five or six months later recurrence was noticed. It was then found that the mass was larger than before, and the annoyance almost unbearable. Both external carotids were therefore secured below the origin of the linguals, and by this means all pulsation was checked, but in order to favour the permanency of the cure the common carotid was tied a few days later. The patient promptly recovered from both these operations, and no cerebral disturbance followed. A twelvemonth later there was some enlargement and pulsation of the terminal branches of the ophthalmic artery; these were in turn tied, and since that date there has been no sign of recurrence.

The result in these cases is most satisfactory, since the treatment of this condition has always been a matter of extreme difficulty. It is interesting to note the recurrence which took place in the second patient after simple ligature of the nutrient vessels and apparently complete excision; this agrees with the usual experience. On the whole one cannot but think that the plan adopted by Beaumont is the more rational, and holds out the best prospect of a cure.

V.—SURGERY OF THE LUNGS.

Tuffier (*Gaz. Méd. de Paris*, Aug. 21 and 28, 1897) read a long and interesting paper on this subject at the Moscow International Congress, in which the most complete summary of what has been attempted and done in this direction may be found. In the main it merely confirms and expands in details Reclus's paper referred to in the last edition of the "Year-book" (p. 203). One or two points may, however, be noticed. Exploratory punctures, in order to assist in making a diagnosis, are considered to be not devoid of risk, and the surgeon should

be ready to follow this proceeding by an immediate operation if positive results are obtained. The existence or not of pleural adhesions is easily determined as soon as the pleura is opened; if none are present, suture of the two layers together is recommended as the proceeding of choice. It is scarcely wise to trust to the cohesion of the two walls, as should a pneumothorax subsequently develop, septic and other troubles may arise and jeopardise the patient's chances of recovery. The incision and drainage of tuberculous cavities is not favoured, and according to his figures 50 per cent. of the cases may be expected to succumb, whilst no permanent benefit has arisen in those patients who survived. The disease usually runs its normal course, even though the walls of the cavity were scraped and disinfected, and subsequently plugged with iodoform gauze; they seldom healed completely. It has been suggested that this was largely due to the walls being unable to contract owing to pleural adhesions, and hence excision of the overlying ribs has been practised; the records are, however, at present too scanty to warrant us in drawing any conclusions as to its value. Pulmonary abscesses following pneumonia are favourable for operation, but although the result of dealing with bronchiectases is to improve the symptoms, absolute cures are not very common. The removal of foreign bodies from the lungs is not associated with a great degree of success, since that is only one of the troubles present; a septic bronchiectasis also exists, and this is by no means so amenable to treatment. The localisation of gangrene of the lung is often a difficult matter, but the practitioner ought not to call to his assistance the aspirator needle, as thereby septic infection of the pleural cavity is easily brought about, and the case is considerably complicated. For the same cause it is most essential that solid adhesions should be present in these cases between the lung and the parietes, and the surgeon is quite justified in delaying the further steps of the operation a few days in order to determine their formation by plugging the wound. Tuffier recommends that the lung should be incised with the red-hot cautery knife, holding that infection of the lung tissue penetrated by it is less likely to ensue than if a bistoury is employed. The cavity, having been opened, is thoroughly explored, necrotic tissue removed, and drainage by tube or gauze provided for. It should not be washed out, however, for fear of filling the bronchial tubes with lotion and "drowning" the patient!

Macewen, of Glasgow (*Med. Record*, Sept. 17, 1897), agreed in the main with Tuffier. He laid special emphasis upon the fact that *the lung* does not necessarily collapse after opening the pleural

cavity, the cohesion of the two smooth serous surfaces being usually sufficient to prevent this. He also stated that a small incision into the pleura is more likely to lead to pneumothorax than a large one. With regard to tuberculous cavities the following practice is adopted by him: If the cavity is small, resection of three or four ribs causes the cavity to collapse. Larger ones should be freely incised, emptied and drained. Very large vomicæ should be thoroughly scraped and packed with iodoform gauze. The improvement noted after such procedures was often immediate and striking.

VI.—SURGERY OF THE NECK.

Foreign bodies in the œsophagus.—Two or three interesting cases have been reported during the year, illustrating the possible methods of dealing with this condition. The first and most important point to be mentioned is the value of skiagraphy in guiding the surgeon to the site of obstruction, as also in settling whether the foreign body has been swallowed or still remains impacted in the gullet. Thus in a case recently under our own observation we were able to determine accurately that a hairpin, said to have been swallowed, was lodged in the upper part of the œsophagus, just above the top of the sternum; two days later further examination proved that the pin was absent from its former situation, and had presumably passed into the stomach, a fact confirmed subsequently by its passage in the fæces. A still more valuable fact is that reported by **Delatour** (*Med. Record*, May 1, 1897), who not only utilised the cryptoscope for localising a metal washer that had been swallowed but was also enabled by its assistance to grasp the foreign body with forceps and remove it. The blades of the forceps could be clearly seen in the screen and guided to the washer.

Bull and **Walker** (*Med. Record*, March 6, 1897) relate a successful case of removal, by *external œsophagotomy*, of a tooth-plate, which had been impacted in the gullet for twenty-two months. The œsophagus was opened just above the sternum upon a bougie, and the edges of the incision were held apart by loops of silk. The walls were here healthy, but an inch lower all instruments were at first arrested, apparently by soft tissues. After a little manipulation it was found that the plate was lying in a pouch in the posterior wall, leaving only the upper and lower ends exposed. The incision in the œsophagus was enlarged downwards till it was about an inch and a half long, but even then the plate could not be removed until the mucous membrane

lying over it had been divided by scissors. A drainage tube was subsequently introduced about four inches into the œsophagus, and a gauze packing around it; rectal feeding was maintained for ten days, by which time the wound had contracted to a considerable extent; merely a gauze wick was then allowed in the wound, and ordinary swallowing permitted. The wound was soundly closed in seven weeks. A statistical account of 167 cases dealt with in this way is appended; in an earlier series there was a death-rate of 24·2 per cent., but in 32 new ones here collected it had been reduced to 15·6 per cent., an improvement mainly due to earlier interference. It is also shown that the mortality increases directly with the duration of the case. The most common causes of death are septic complications, especially involving the mediastinal tissues. The practical outcome of this inquiry is to suggest that if removal by operation is to be undertaken at all, the earlier it is proceeded with the better.

Treatment of cut throat.—The rules laid down for the guidance of surgeons in their treatment of this condition have been considerably modified of recent years, thanks to the influence of antiseptic precautions. It was formerly considered essential to success that no stitches should be put in these wounds if they communicated with the air-passages, except, perhaps, at the extreme limits of the incision, and a large percentage of patients were expected to die of septic pneumonia or some such complication. It is, therefore, extremely satisfactory to note that **Platt**, of Manchester, has been able to record 10 cases of cut throat involving the air-passages with 8 recoveries (*Brit. Med. Journ.*, May 8, 1897). In one of the fatal cases no sutures were introduced and no attempt to close the wound instituted; whilst in the other the patient, who was an unhealthy man with diseased liver and kidneys, died of acute pneumonia, but with no evidence of its being septic in origin. In all the other cases the wound in the air-passages was more or less completely stitched up; in 4 it was totally closed and no tracheotomy tube was introduced, and of these the lesion was twice through the thyro-hyoid membrane, and twice involved the crico-thyroid space. In the remaining four cases a tracheotomy tube was inserted—in one through the crico-thyroid interval, which had been opened; in another through the trachea, which had been completely divided, the divided segments being an inch apart; in a third case, where the thyro-hyoid membrane was involved, a high tracheotomy was performed; and in a fourth, involving the crico-tracheal membrane, a fresh vertical slit in the trachea was made for the tube. Platt suggests that, if it is practicable, it is

wise to anæsthetise the patient with chloroform, as thereby the wound can be dealt with much more efficiently; if he is suffering severely from shock it may be wise to delay the operation for a few hours, whilst intravenous infusion may be employed when he has lost much blood. Platt recommends that a tracheotomy tube should be introduced in all cases where the larynx or trachea has been completely divided, as also when the wound is in the thyro-hyoid space and has severed the epiglottis, since œdema of the larynx is very likely to supervene. It is also suggested that the tube should only in rare cases be inserted through the suicidal wound; it is much better to make a fresh incision through the trachea at a lower level. His own experiences lead him to believe that it is frequently possible to close the air-passages entirely. The wound is cleansed, and the mucous membrane first dealt with. None of the stitches employed should penetrate the mucous membrane, but they must secure a good hold of the fibrous and cartilaginous tissues around it. The lateral stitches should be introduced first, and finally the central portion of the wound dealt with, but none of the sutures should be tightened till all are inserted. As soon as the air-passages are shut off a much more thorough purification of the wound is possible. The divided muscles and fasciæ are then dealt with layer by layer, and the neck is thus built up again to a more or less normal condition. It will usually be necessary to insert a drainage tube at one or both angles of the wound. As to after-treatment, the tube need not, as a rule, be maintained in position beyond two or three days, by which time the risk of dangerous swelling of the mucous membrane has passed. The question of feeding is an important one; Platt is convinced that in most cases it is unnecessary to feed by a tube or by the rectum, and that the patient may be safely allowed to swallow fluid food. In cases, however, where the epiglottis is injured, where the larynx or trachea is completely divided, or where the pharynx or œsophagus is opened, it is better to adopt rectal alimentation for two or three days.

In wounds of the neck not involving the air-passages, primary suture is also advisable in most cases, after thorough purification. Of 25 cases thus treated in the Manchester Infirmary, to which Platt refers, 19 healed by first intention.

Similar conclusions as to the value of primary suture are arrived at by **Hogarth** (*Brit. Med. Journ.*, Aug. 21, 1897) and a successful case is recorded by him. The thyro-hyoid membrane was almost entirely divided, and the epiglottis cut across, the wound extending on each side as far as the sterno-mastoid muscles. The whole wound was closed, and the divided tissues of the neck

united layer by layer. No tracheotomy tube was introduced, and the patient did perfectly well. He maintains that a tube should be employed only when secondary swelling causes obstruction to the respiration.

The surgical treatment of exophthalmic goitre.—In the last number of the "Year-Book" we noticed the fact that Jaboulay had operated thrice for this affection by dividing the cervical sympathetic chain, and that he had been well satisfied with the results. During the past year several communications dealing with the same proceeding have been made, and three or four papers relating cases were read at the French Surgical Congress in October. The most important of these was contributed by **Jonnesco**, of Bucharest (*Presse Médicale*, Oct. 23, 1897), who, after mentioning the former operative measures that have been utilised, described more in detail the three plans that have been followed in dealing with the sympathetics, viz., simple division, partial extirpation, and complete removal of the chain and its ganglia. The first plan included merely the three operations of Jaboulay noted last year; the operation has apparently not been repeated. Twelve cases of partial removal of the sympathetic chain, including the superior and middle ganglia on both sides, have been reported, and the patients all recovered. Finally, Jonnesco and one or two others have practised total removal of the entire sympathetic tract on each side of the neck. The operation itself does not appear from the descriptions to have proved especially difficult; an incision is made along the posterior border of the sterno-mastoid, and the muscle for its whole length drawn forwards together with the sheath of the vessels; the sympathetics are found immediately in front of the transverse processes of the vertebræ, lying on the longus colli. The results appear to have been manifested immediately: the exophthalmos diminished rapidly, so that even on the day following the operation some change was noticeable. The tachycardia similarly was influenced for good, although the pulse occasionally remained at 80 to 90 for some few days. The goitre quickly shrank, and the tremor disappeared. The results, extending back in some cases for two years, seem to be durable, and although two relapses have been noted, yet they are not of a very serious nature. **Abadie**, who was the first to recommend on theoretical grounds this proceeding (*Progrès Méd.*, Oct. 23, 1897) is amply satisfied with the results hitherto gained. He maintains that the primary mischief is in the upper part of the medulla, and that thence excitation of the vaso-dilator nerves is transmitted through the sympathetic chain, which is itself neither abnormal nor degenerate. Hence he

concludes that simple section is quite sufficient to bring about all the good results obtainable, and that total resection is absolutely unnecessary. Naturally it is desirable to divide the trunk as high as possible, so as to eliminate the vaso-dilator fibres of the orbit which pass upwards from the superior ganglion, and hence removal of this structure is perhaps advisable; if the cord is merely divided below it, some degree of exophthalmos may persist. The operation is not one that can be hurried over, and must take some time, and hence it is undesirable to do more than is necessary, since these patients never take an anæsthetic well. **Faure's** experiences in three cases (*ibid.*, p. 266) illustrate this point; in the first all went well; in the second the right chain was satisfactorily dealt with, but during the proceedings to expose the left a grave attack of syncope supervened, possibly from interference with the vagus; the third case was fatal from chloroform syncope.

On the other hand it must not be forgotten that partial thyroidectomy is also a proceeding by no means devoid of danger, both from heart failure and also from that mysterious group of symptoms which, coming on within a few hours of the operation, rapidly lead to a fatal issue. **Lejars** (*Bull. et Mém. de la Soc. de Chir. de Paris*, March, 1897) relates a case in point. Against this, however, may be mentioned the fourteen successful cases of Kummell's, reported by **Schultz** (*Berlin. Klin.*, June, 1897). In most of the cases the symptoms were well marked, and life was even seriously threatened. There were no mishaps during or after the operations, and twelve are claimed as being totally cured, the remaining two being much improved. The cases have been under observation for from two to seven years, and no tendency to relapse has been noted in any. **Paul**, of Liverpool (*Brit. Med. Journ.*, July 3, 1897), reports six cases of partial thyroidectomy operated on successfully as far as regards the immediate results, but in none of them can he claim a total cure. Very frequently the immediate effects are startling, but after the temporary rapid improvement comes a period of slow progress, and the cases must be watched for years before the final results can be accurately gauged. All of his six cases have, however, been permanently benefited.

Excision of both external carotids for malignant disease of the jaw.—**Dawbarn** (*Annals of Surgery*, Sept., 1897, p. 366) relates a case in which he had utilised this proceeding in dealing with a sarcoma involving the superior maxilla. The growth was noticed in August, 1895, and the diagnosis was confirmed by microscopic examination. In April, 1896, the left external carotid was

completely excised, and this was followed a month later by excision of the right external carotid and of the superior maxilla; a year later there was no sign of recurrence. Dawbarn believes that the removal of the two vessels would have sufficed to bring about a cure alone, without resorting to the extirpation of the growth. He speaks of other cases in which he had undertaken the same type of treatment, and in none had there been any recurrence; there had also been no fatal result. Considerable stress is laid upon the necessity of excising the whole artery; simple ligature of the trunk does not suffice, since the collateral circulation is so abundant. The operation is tedious and rather lengthy; it is not advisable, therefore, to undertake it on both sides at the same time. Dawbarn recommends that one should begin from below and work upwards, tying all the branches up to the terminal divisions. Owing to the freedom of the anastomosis through the angular branch of the ophthalmic, he also suggests that the latter communication should be secured. It certainly seems that this proposal is a useful one, and that it would be wise to undertake it either with or without removal of the growth; in inoperable cases it ought certainly to be performed. Dawbarn is doubtful whether this practice is of much use in growths of the naso-pharynx, but for tongue and jaw cases it may well be tried.

VII.—SURGERY OF THE ABDOMEN.

The treatment of general septic peritonitis is a subject that must necessarily obtrude itself continually on the surgeon. Left to itself or treated by means of opium, as was formerly the case, it is almost certain to prove fatal, and there is no dissentient from the general acceptance of the statement that the only hope for the patient lies in laparotomy. Truly that hope is often but a slender one, owing to the condition of toxæmic depression into which the patient quickly passes, and until general practitioners realise more clearly the hopelessness of this malady apart from surgery, and the necessity for that interference being undertaken at an early date, the statistical records will not improve. The present status of the operation may be gauged from the following figures, which have been reported during the year:—**Korte** (*Centr. f. Chir.*, App. to No. 28, 1897, p. 60) has had under observation 99 cases of general peritonitis during the past seven years, due to infection from the viscera (exclusive of puerperal, cancerous, tuberculous, and chronic cases), and of this number 71 were operated on with 25 recoveries (35·2 per cent.),

and 28 were treated without operation with but 6 successes (21·4 per cent.). Perforation of the appendix was responsible for 34 of these cases, and 13 were saved; perforation of the stomach or duodenum was the cause in 6, and only one recovered; an intestinal origin in 6 cases resulted in 6 deaths, and of the 14 secondary to disease of the female genitals, only 3 were saved. Other surgeons have had much the same type of results; **Sonnenburg** has saved 3 cases out of 20, and **Lenander** 1 out of 6. In America the same sad story has been told. **McCosh** saved 7 out of 43 cases, whilst **Weir** has not been successful in a single case out of 20 he has had under his care. (*Annals of Surgery*, June, 1897, p. 687, and August, p. 235.)

Under circumstances apparently so hopeless, we are glad to note anything which seems to hold out a hope of better things, and it is most satisfactory to report that **McCosh** (*loc. cit.*) has been able to report 7 recoveries out of his last 8 cases, and this does not seem due to the fact that they were in a more favourable state for operation than others. With two exceptions, the condition of all seemed desperate, and certainly in three spectators considered that the condition of affairs seen inside the abdomen precluded the slightest hope of recovery. The cause of his success is attributed by McCosh to thorough removal of all the septic material accumulated in the abdomen, and the early restoration of intestinal peristalsis; the first of these desiderata was obtained by irrigation, the latter by the intra-intestinal injection of a concentrated saline injection. The general plan of operation was as follows:—Chloroform was usually employed as the anæsthetic. The incision is five or six inches in length, its position being modified according to the organ supposed to be the cause of the trouble; the purulent fluid is allowed to flow away by turning the patient on the side. The intestines are usually permitted to escape from the abdomen into hot towels held by assistants, though if they are enormously distended and the heart's action is weak this is not advisable. Should the distension be so great that replacement is difficult, the ileum is opened in one or more places and an exit given to gas and fæces, the incisions being subsequently secured by Lembert's sutures. The cause of the trouble is then dealt with, and afterwards the intestines and peritoneum are thoroughly irrigated with hot normal salt solution. If the intestines have been removed, they are gently washed with the contents of several flasks of lotion, whilst at the same time a stream from an irrigating jar is running into every corner and crevice of the abdominal cavity. If the intestines are left *in situ*, the edges of the incision are raised by an assistant and flask after flask is

emptied into the cavity, so that the intestines can be separated and all retained fluid removed. Irrigation is preferable to sponging or swabbing, since by the latter the superficial endothelium is likely to be removed, and the vitality of the walls diminished. Of course, no amount of cleansing can thoroughly sterilise the peritoneum. The temperature of the lotion should be at least 110° F., preferably 112° or 114°, and by this means the heart is usually stimulated rather than depressed. A good deal of lotion may with advantage be left in the cavity. The injection of magnesium sulphate is then made and, if possible, into the upper end of the jejunum; about an ounce of the salt in a saturated solution should be introduced through an aspirator needle, and the small puncture closed by a Lembert's suture. The peritoneum is then drained by strips of gauze placed amongst the intestines in various directions, and perhaps a glass tube may be inserted into the pelvis. The wound in the parietes is left partially open, but it may be well to insert some silkworm-gut stitches and tie them loosely, so that at a later date the wound may be more effectually closed. After the return to bed, if the condition of the stomach permit, a ten-grain dose of calomel may be administered with advantage. In several of these cases which seemed at first absolutely hopeless the patient commenced to expel flatus before twenty-four hours, and this was soon followed by the passage of a motion. The two deaths of the eight operated on according to these directions were due, one to the effects of the peritonitis, and the other to pulmonary complications five weeks after operation, so that this case may in reality be claimed as a success. In the discussion which followed this report (New York Surgical Society) most of the speakers agreed as to the value of the suggestion, but did not entirely concur with the necessity of allowing the intestines to escape. **Abbe** thought that after the operation the application of ice to the abdomen was valuable in stimulating peristalsis, and diminishing bacterial activity. He also thought it better not to remove the lymph which adhered to the coils of gut, as it was Nature's method of protecting a weakened tissue. When the patients recovered, the lymph was readily disposed of, so that in six months' time the intestines would be found entirely free. In the discussion at the German Surgical Congress (*loc. cit.*) **Korte** stated that he thought irrigation of the peritoneum was immaterial so long as good drainage was secured; he also emphasised the importance of establishing early action of the bowels and refraining from the use of opium. **Sonnenburg** always opens the abdomen in the right iliac fossa since so many of these cases originate in the appendix;

he incises it freely and packs with antiseptic gauze for drainage. **Israel**, of Berlin, utilises a free crucial incision, and packs in iodoform gauze; he claims to have had more successful results since he adopted this method. **E. Owen** relates an interesting case, followed by recovery, in a clinical lecture (*Clin. Journ.*, June 30, 1897); he, too, insists on the importance of irrigation with hot saline solution, and never uses a sponge. Warm lotion is of no use in the suppurating peritoneal cavity of a boy in a state of collapse, whilst a really hot saline solution is not only a cleanser, but is a valuable stimulant, and thus greatly helps in diminishing the shock of the operation, and tiding over the crisis.

An important point in the operative treatment of *acute intestinal obstruction* is noted by **Ernest Stokes** of Baltimore (*Annals of Surgery*, Sept., 1897), and although it is by no means novel, yet it is worthy of comment. He reports two cases of severe intestinal obstruction, where fæcal vomiting had been continuing for some time, and indeed the gastric contents were being poured out at intervals without much effort. The patients were anæsthetised in the horizontal position, and then lifted on the table. In the first case, as soon as the surface of the abdomen had been cleansed, the thin offensive yellowish fluid began to pour out of both nose and mouth, and the patient was rapidly asphyxiated. In the second case ether was employed as an anæsthetic, and the abdomen having been cleansed, the patient was placed in the Trendelenburg position, when a similar *contretemps* happened, resulting in immediate death. The point suggested by these two cases is that in cases of acute obstruction where the stomach is evidently filled with liquid fæcal or semi-fæcal material readily ejected, the greatest care must be taken in administering an anæsthetic. In many cases it will suffice to use cocaine for the parietal incision, and such is always preferable under these circumstances; if, however, a general anæsthetic is considered desirable, the stomach should always be thoroughly washed out prior to its administration, and the patient must never be placed with the pelvis higher than the head, or even on the same level; the shoulders should always be well raised.

Intestinal resection and suture.—Strenuous endeavours are still being made by surgeons to secure an ideal form of suture or some simple and safe contrivance for bringing about intestinal reunion. The old-fashioned methods of suture, though satisfactory and safe, are open to the objection that they take much longer time than is desirable, since the patients on whom the operation is performed are often in a very debilitated condition. The introduction of

Murphy's button was a new departure, which demonstrated that rapidity of execution was obtainable together with security. During the past year many suggestions have been made for securing similar ends, and to a few of these we must refer.

Maunsell's operation has always had a select few who have recommended it as one of the best methods to employ for end-to-end union; the principle is good, and the results hitherto obtained have been very satisfactory. A modification of value has been proposed by **Ullmann**, which promises to bring about a considerable reduction in the time required for its execution (*Centr. f. Chir.*, Dec. 19, 1897). The longitudinal incision is

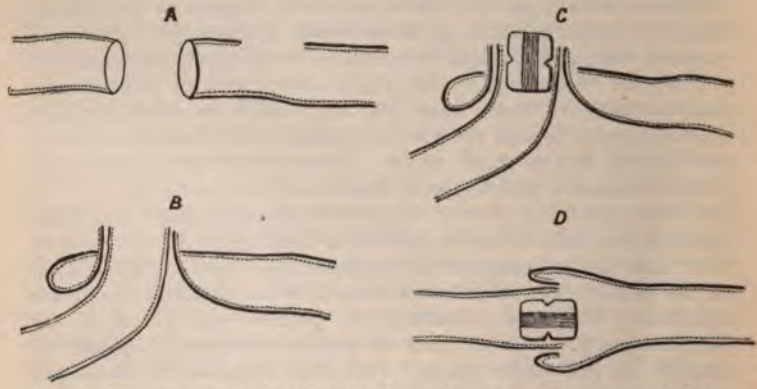

Fig. 3.—Ullmann's method of intestinal anostomosis. The accentuated line denotes the serosa of the proximal end; unaccentuated line, the serosa of the distal end; dotted line, the mucosa.

made in the anti-mesenteric border as usual, and the invagination performed (as in A and B of the accompanying diagram, Fig. 3), so that two tubes of intestine project through the opening one within the other, lying with their peritoneal surfaces in contact, and the mucous membrane of one segment is directed inwards, that of the other outwards. In the original operation these two circles were sewn together by sutures which passed through the whole thickness of the walls of each segment. Ullmann's modification consists in the use of a bobbin, round which the two segments are tied together. A piece of carrot, prepared in the shape of a hollow cylinder, 2 to 2½ centimetres long and 1½ to 2 centimetres broad, with a groove running transversely around its middle, is placed inside

the inner segment, and a single silk thread tied round the two segments so that the thread lies in the groove, and, of course, since it is in apposition with the mucous membrane, it lies inside the lumen of the gut (C). The invagination is now reduced by traction above and below, and the longitudinal incision closed by interrupted or continuous sutures (D). The carrot lies within the lumen of the bowel, and the hole in its centre allows for the onward passage of the intestinal contents. Of course it is not essential that carrot should be employed; turnip, potato, or decalcified bone will do equally well, provided that the bobbin is sufficiently firm to stand a ligature being tied tightly round it, and that the passage through it is large enough. If carrot is employed, it must be fairly hard, but not fibrous; there is sufficient resistance in it to withstand the action of the intestinal juices until union has occurred. Ullmann has carried out this operation with success in a number of dogs, and twice in the human subject, once for intestinal exclusion on account of an artificial anus, and again in a case of tuberculosis of the cæcum; in both cases the recovery was quite uneventful. **Pilcher** (*Annals of Surgery*, April, 1897, p. 485) has recorded a case in which he utilised it after removing a large growth from the splenic flexure of the colon: he employed, however, a potato bobbin instead of one made of carrot. The patient did well for ten days as far as the operation was concerned, but then died of tetanus. **Eix** (*Centr. f. Chir.*, Oct. 30, 1897) has also employed this method with success after removing a portion of the bowel which had become gangrenous in a strangulated obturator hernia, and this in spite of the fact that withdrawal of the gut from the site of strangulation led to its rupture and extravasation of the fæcal contents into the peritoneal cavity. There can be no doubt that this proposal is a most valuable one, and has considerably added to the already great advantages of Maunsell's operation.

Murphy's button still forms a fruitful subject of discussion, but as we formerly anticipated, it is beginning to be replaced by other less objectionable appliances. Its most vigorous supporter is **Willy Meyer**, and at the meeting of the New York Surgical Society on March 10 he read a paper dealing with its value in gastro-enterostomy, and showed five patients on whom it had been employed (*Annals of Surgery*, July, 1897, p. 31). He quotes a variety of statistics to prove its merits, and has collected a new series, mainly from the practice of American surgeons, giving a death-rate of 36·66 per cent. Of the 60 cases, 51 were for malignant disease of the pylorus, and of these 22 died (43·13 per cent.), whilst of the nine operated on for simple stricture all

recovered. This difference in the results, according to whether the pyloric obstruction is simple or malignant, is marked in all the records. A few of the points suggested by him as to the technique of the operation are worthy of note. In the first place he considers that additional supporting stitches should always be employed; whether one operates by the Wölfler or the von Hacker method (*i.e.* whether one brings up the jejunum to the anterior wall of the stomach across the transverse section, or unites the bowel to the posterior wall through a hole in the transverse mesocolon), there must always be traction upon the line of union, and this in itself is sufficient to predispose to a mishap. Murphy was at first strongly opposed to this additional precaution, but experience is beginning to prove its advisability. Meyer advises a continuous suture to be used, and that it should be inserted at least a quarter of an inch away from the edge of the button. Of 39 patients in whom the additional sutures were employed, 29 recovered, and none of the fatal cases died from perforation. Another point strongly emphasised is the need for stitching the margins of the opening in the mesocolon to the stomach wall when doing posterior gastro-enterostomy; if this is not attended to, contraction of the aperture is almost certain to follow, although under other circumstances the fistulous communication has no tendency to shrink. In benign strictures, even Meyer recommends that the button had better not be employed, since it has often been found to fall back into the stomach even when the posterior operation is utilised, and no means of preventing this occurrence has been discovered. Of course, in malignant cases, where the operation is merely a palliative measure, this is of little consequence, since the brief spell of life remaining to the patient is not likely to be appreciably shortened by it; but where the stricture is simple, and many years of life may follow the operation, it is better not to expose the patients to the risk of such an accident. In these cases, also, the gastric wall is considerably hypertrophied, and some difficulty may be experienced in tucking the whole thickness comfortably within the cup. Another important point is to secure the correct portion of the bowel with which to connect the stomach. If a point low down the gut is selected, the patient is likely to die quickly from inanition, even should the anastomosis be successful; this is due to the large section of absorbent surface thrown out of function. Such an accident readily happens even in the hands of those who are alive to its possibility; thus in one case where the surgeon quite thought he had secured the upper end of the jejunum, it was afterwards found that a nutrient enema was vomited after a

short interval and almost unchanged (**Briddon**, N.Y. *Med. Record*, Feb. 20, 1897, p. 280), and after the patient's death in twenty days the lower part of the ileum was found to be attached to the gastric wall. To avoid this misadventure, the surgeon should always withdraw the colon and omentum from the wound; the hand is then inserted along its under surface to the left side; the lowest portion of the duodenum as it crosses the base of the mesentery is then readily detected, and no possible mistake can ensue. **Graff** also reports favourably of the button, quoting Schede's and Sick's statistics, which give twenty-five cases of gastro-enterostomy and end-to-end suture; with fourteen deaths, it is true, but in none of them could the button be held responsible for the fatal issue (*Von Langenbeck's Archiv*, Bd. lii., Hft. 2). **Marwedel** (*Centr. f. Chir.*, App. to Nov. 28, 1897, p. 99) reported to the German Surgical Congress the results gained with this appliance in the Heidelberg clinique. Fifty-five cases in all had been operated on, including 35 gastro-enterostomies with no death directly attributable to the button, although 12 died within three weeks of the operation; in only 15 of the 23 recoveries was the button evacuated, but it does not seem to have given rise to any inconvenience. Cholecystenterostomy was undertaken thrice, with 2 recoveries, but in the fatal case the button was *in situ*. Of the 17 operations on the intestines, 6 were for gangrene of the gut, with 3 recoveries, but in the 3 fatal cases diffuse peritonitis was present at the time of operation. There were 8 intestinal anastomoses with 1 death, and 3 resections of the cæcum, of which 2 were fatal. These results are remarkably good, and fully justify Marwedel in summing up in favour of the button. At the same time he maintains the importance of adhering strictly to Murphy's original rules, and points out that many of the failures were due to defective buttons being employed.

On the other hand there is a strong and growing feeling against putting such a hard and rigid contrivance within the bowel. This is evidenced by the multiplicity of new bobbins and buttons which are almost weekly being announced. The majority of them are probably of little value, but amongst all these suggestions we hope that sooner or later some more perfect appliance may be forthcoming. One or two are perhaps worth mentioning. **Ball**, of Dublin (*Brit. Med. Journ.*, April 24, 1897), has contrived a decalcified ivory or bone ring (Fig. 4), which is made in three sizes, the centre of each being perforated to allow the passage of intestinal contents. The upper and lower ends are smoothly rounded off, whilst around the circumference a

deep groove is turned, wide enough to allow involution of the cut edges of the intestines whilst keeping the peritoneal surfaces in tolerably close contact; a considerable undercutting of this

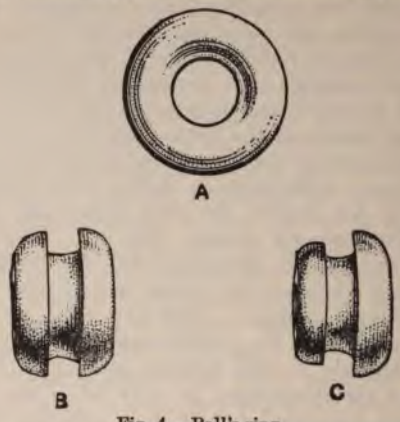

Fig. 4.—Ball's ring.
A, vertical view; B, C, lateral view showing grooves.

groove provides accommodation for any excess of involuted intestine. The chief feature in the application of this ring is the fact that a continuous lacing suture connecting both portions

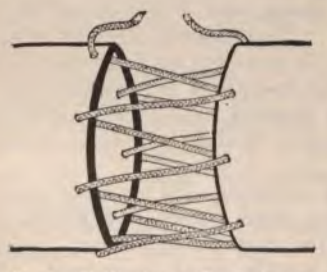

Fig. 5.—Ball's ring. The lacing suture complete before introduction of the ring.

Fig. 6.—Ball's ring. Diagram of section showing the ring in position, with involution of edge of the intestine after tightening the lacing suture.

of the intestine is passed loosely through the entire circumference of the divided ends of the bowel before the ring is placed in position (Fig. 5). To do this the loose threads are separated, and then the sutures are gently pulled on loop by loop in the same way as one tightens a boot lace, so as gradually to draw the ends of the

bowel into the groove, tucking them in so as to bring the peritoneal surfaces into close apposition (Fig. 6). After tying the thread, a continuous Lembert stitch is introduced all round. Four cases have already been operated on by this means, with three recoveries, and from the symptoms of the fatal case it was evident that death was not due to any imperfection in the anastomosis. **Frank** (New York *Med. Record*, Oct. 3, 1896), **Cheatle** (*Lancet*, May 22, 1897), and others have also devised methods of intestinal anastomosis which, though successful in animals, have not yet been used in the human subject.

Radical cure of hernia.—**Lucas-Championnière** (*Journ. de Méd. et de Chir.*, Aug. 25, 1897) made a most important communication to the Moscow Congress and also to the Académie de Médecine dealing with this subject, taking as his basis the results of 650 operations which he had himself undertaken. Of this number 556 were inguinal, and all but 49 in men; 46 were femoral, 13 men and 33 women; 22 were umbilical, all in females; 14 epigastric, all men; and 12 ventral, only 2 of which were in men. In discussing results he is able to state that only in 23 cases had there been any recurrence; it was more or less anticipated in half of these, owing to their obesity, age, or to the large intestine being involved, or possibly to their suffering from chronic bronchitis or emphysema. The other half were due to the patients being careless, and overstraining themselves at too early a date; of the whole number of relapses, in only one had the hernia become of any size. No truss was ever employed or worn after the operation, and indeed the author states that he does not consider any cure radical if such is needed. The principles which should guide the surgeon in his operation are then indicated. All accessible omentum should be removed, and not merely that which is in the sac; it is one of the most fruitful causes of recurrence, insinuating itself into any small infundibuliform depression which may exist. Then, too, the peritoneum must be destroyed not only up to the neck of the sac, but beyond the internal ring, so that it is flush on the inner aspect, and presents no funnel-shaped depression. Again, the abdominal wall must be reconstituted so that it forms a solid barrier against possible recurrence. Drainage is considered an important element in securing firm union, in that it tends to promote solidity of the deep cicatrix. As to indications for operation, radical cure is essentially an operation for young people, and, indeed, up to the age of forty no other proceeding should be attempted. After that age it should only be undertaken to meet special requirements, such as pain, irreducibility,

and accidents of that nature. In women inguinal hernia should always be operated on, since the cure can be made so absolute that no tendency to recurrence is likely to be noted. Femoral herniæ are so liable to strangulation that operation should be freely undertaken, and at a more advanced age than for the inguinal variety. Epigastric hernia, being extremely painful, should also be submitted to operation in all cases. Umbilical and ventral herniæ cannot be in any way controlled by trusses, and are likely to threaten life, so that active interference is always justifiable and even advisable. As to mortality, Lucas-Championnière is able to report that only 5 deaths occurred as the result of his 650 operations, and he once had a run of 265 operations without a single mishap; the death-rate thus only amounts to ·7 per cent. It is interesting to note that some of these operations date back sixteen years.

Even better from a percentage point of view are the results given by **Coley** (*Annals of Surg.*, March, 1897, p. 270), who has operated on 360 cases with but one death (*i.e.* with a mortality of ·28 per cent.). Of this number 326 were for inguinal hernia, 25 for femoral, 6 for umbilical, and 3 for ventral. As to the methods employed in the inguinal variety, Bassini's operation with kangaroo tendon was utilised in 300 cases, with but 2 relapses; Bassini's, with silk sutures, 1 case with 1 relapse; suture of the canal without transplantation of the cord, 24 cases with 3 relapses. In the femoral and inguinal hernia in females there were no relapses; of the 9 umbilical and ventral herniæ operated on, 4 have relapsed, all of them apparently in fat women. This last experience is by no means uncommon; in anybody's hands recurrence is very likely to follow, and unfortunately even when the extremest precautions are taken, sepsis is only too likely to develop in these unhealthy patients. One reason for Coley's success lies in the fact that 250 of his patients were under the age of fourteen, thus again emphasising the opinion that the operation may be most beneficially undertaken in children; the tendency to recurrence increases with the age of the patient. Some surgeons still object to operating on children on the ground that such proceedings are more dangerous; to meet this objection Coley has collected 832 cases operated on under the age of fourteen by Broca, Félizet, and himself, and the mortality works out at the insignificant rate of less than ·5 per cent. He holds, however, that operation should not be undertaken until treatment by truss pressure for two years has been tried and failed.

As to the carrying out of Bassini's operation Coley gives a few hints. In the first place he considers the change from silk to

kangaroo tendon important; he has had fewer cases of suppuration since the change; it is also advisable to place one suture above the cord so that it emerges between the two highest stitches; all these deep sutures should be interrupted. Another important point is carefully to dissect back the aponeurosis on the external oblique, especially on the inner side, so that it may be brought together without difficulty over the cord, and for this a continuous suture is advised. After suturing the skin incision a moist dressing is applied held in place by a spica bandage, and in children this may be reinforced by a plaster-of-Paris spica. The patients are kept in bed for about two weeks, and allowed to leave the hospital in three weeks from the operation. No truss is ever employed afterwards.

Other methods of operation have been suggested during the year, but none of them are of any great importance. Bassini's operation seems to be coming more and more into favour, and all less extensive proceedings are a little untrustworthy.

It is interesting to note that in **Roux's** clinique (*Rev. méd. de la Suisse Romande*, July 20, 1897) the results of 324 operations give a percentage of relapses after Bassini's operation three times as great as that following the use of what is known as Ferrari's method, which is, apparently, similar to that which we know as Mitchell Banks's operation. Suppuration occurred in about 20 per cent. of the cases, and recurrence was much more frequent after suppuration. Atrophy of the testicle was noted in 12 cases, and relatively more frequently after Bassini's operation. These figures, so different from both Bassini's own and Coley's, suggest the question as to whether the operation was correctly carried out.

One other suggestion must be noted in conclusion. **Lannelongue** (*Rev. de Thér. Méd. Chirurg.*, Aug. 1, 1897) reports a series of 51 operations for hernia undertaken by the injection of a solution of chloride of zinc into and around the inguinal canal, and claims to have cured all with the exception of two, one of which was operated on again with success. None of the results, however, are of longer duration than one year. The object of the proceeding is to set up a sclerosing inflammation in the inguinal region which shall lead to the occlusion of the sac and the closure of the inguinal canal. **Lucas-Championnière** (*loc. cit.*) urges very strongly objections which will present themselves at once to the minds of all surgeons. This proceeding is a distinct step backwards towards the uncertain surgery-in-the-dark of the Middle Ages; no two herniæ are alike, or capable of being dealt with in the same way; the effect of the injection is not limited to the sac, but necessarily involves the surrounding tissues, including those of the cord, and

the vascular supply of the testis is liable to suffer in consequence. Certainly Lannelongue has not yet noticed any testicular trouble, but the majority of the patients operated on were children, whilst sufficient time has scarcely elapsed to know whether or not mischief has been done. Our only object in mentioning this suggestion is to protest against it.

Partial resection of the liver.—**Elliot**, of Boston (*Annals of Surgery*, July, 1897, p. 83), reports a most successful case in which he removed a tumour of the liver, including about one-fifth of the whole organ, together with the gall bladder, for what proved to be an alveolar sarcoma, probably starting in the neighbourhood of the latter structure. The mass was adherent to the intestines, but on freeing it removal by the thermo-cautery was possible. The wound surface was five inches long and two broad. The bleeding was profuse, but was controlled by pressure forceps and gauze packing. The cystic duct and most of the vessels were tied with silk, and a few clamps were left *in situ*. The peritoneal cavity was walled off by gauze pads, and the cavity stuffed with iodoform gauze. In spite of some discharge of bile the wound healed rapidly, so that the patient was discharged from hospital on the twenty-first day. Death ensued three months later from recurrence in the intestinal walls. **Heidenhain** (*Deut. med. Wochs.*, Jan. 21, 1897) relates a very similar case in a woman aged 61. The disease started in the gall bladder, and the neighbouring hepatic tissue was infiltrated. The whole mass was removed with the cautery, the cystic duct being tied. The patient made a good recovery, and was discharged in six weeks. Unfortunately recurrence ensued in the liver substance, and death followed in three months from the operation. **Müller** (*Centr. f. Chir.*, App. to No. 28, 1897, p. 118) reported to the German Surgical Congress a patient still well from whose liver he had removed a cysto-adenoma seven years previously. He also related two other cases of partial resection of the liver. In the first he controlled the bleeding by a double ligature of iodoform gauze passed deeply through the hepatic substance and tied firmly; there was scarcely any loss of blood, and the stump was fixed to the abdominal parietes by a few stitches. The wound healed quickly, but recurrence followed, and the patient died eight months later. The second case was a cysto-adenoma of the right lobe; removal was not difficult, and all went well till the eleventh day, when the patient succumbed from a pulmonary embolus. In Elliot's paper (*loc. cit.*) an excellent account is given of the chief cases in which resection of portions of the liver has been undertaken, and it appears that of the 46 cases

there recorded only four died as the immediate result of the operation, giving a mortality of less than 10 per cent., a remarkably satisfactory result when one considers the friable nature and extreme vascularity of the organ, and the fact that in 1886 the calculated mortality of wounds of the liver was 62 per cent.

Kousnetsoff and **Pensky** (*Revue de Chir.*, Nos. 7 and 12, 1896) have studied the best methods of dealing with hepatic wounds and of removing portions of the viscus by means of experiments on dogs and rabbits. Their conclusions are as follows:—(1) Ligatures applied lightly to the liver substance are not sufficient security against either the early or late bleeding; (2) the intraperitoneal treatment of the stump, combined with tamponnade, is the most satisfactory method to employ, although extraperitoneal treatment is, perhaps, a little more secure; (3) for the application of sutures through the liver substance rounded blunt needles should be employed; (4) bleeding is most securely controlled by the insertion of deep ligatures through the hepatic tissue, drawn slowly but firmly together; (5) the application of ligatures of single vessels is scarcely practicable, since the friable vessel walls are almost certain to be cut through; (6) the suturing of omentum over the stump is uncertain and takes up valuable time; (7) for the thorough exposure of the liver an incision parallel to the costal border is recommended. **Auvray** (*ibid.*, No. 4, 1897) has repeated the experiments of the above observers and fully confirms them, especially as to the value of the constriction of the liver with deeply placed gauze strips passed through the organ by means of a blunt needle, and slowly though firmly tied. He removed portions of the liver from seven dogs, and of the five that survived the chloroform narcosis all recovered satisfactorily.

Hydatid cysts of the liver.—**O'Conor** (*Annals of Surgery*, May, 1897, p. 547) gives some useful hints as to the method of dealing both with hepatic abscess and hydatids, whilst relating a series of cases which have come under his treatment, and some of these will serve to indicate the present attitude of surgeons in dealing with the latter affection. In the first place he alludes to the risks of puncturing these cysts for diagnostic purposes; they are always extremely tense, and not even the finest needle can be introduced through their walls without causing a subsequent leakage, and this may induce toxæmic symptoms of some gravity. Usually a marked urticaria follows, and this may break out in a few minutes, whilst even a fatal result may follow. If a needle is used at all the surgeon must be ready, in the event of a positive result being obtained, to operate immediately. Again, he notes that in the majority of cases where the endocyst is not

completely removed at the first operation, suppuration more or less profuse almost invariably follows; he therefore advises that an attempt should be always made to extract it; seizing it with forceps is unsatisfactory since the membrane is always friable, and he recommends that a Jacques catheter should be introduced into the cavity and the nozzle of an irrigator attached to it; the quivering mass is then probably forced by the pressure of the lotion into the wound, and can easily be extracted by a pair of fingers.

An interesting case of the removal of multiple hydatids from the interior of the abdomen is related by **Moore** (*Intercolonial Med. Journ. of Australasia*, June 20, 1897). The whole interior of the abdomen was studded with hydatid cysts, the omentum and pelvis being especially affected. Four operations were performed in all and forty-seven cysts were taken away. Some of them were removed together with the affected portion of the omentum, whilst many in the pelvis had to be opened, and the contents evacuated before the cyst wall could be withdrawn. All the operations were recovered from in a most satisfactory manner, and no complications arose. Considerable stress was laid upon the importance of not attempting to do too much at any one time; those hydatids should be dealt with which could be easily reached through the incision, and then the wound closed. At the next operation a fresh incision should be made to enable the surgeon to reach those whose presence he had been able to detect on a former occasion.

Operative treatment of cholelithiasis.—There is now but little diversity of opinion as to the desirability of removing gallstones as soon as possible after their detection if they are giving rise to any serious symptoms. The risks of leaving them *in situ* are becoming constantly more obvious, and the fact that cancer of the gall bladder is almost invariably associated with their presence is a potent argument for early interference. One point, however, has not yet been sufficiently realised by physicians—viz. the risks of leaving a patient for a prolonged period in a condition of intense jaundice. In such individuals surgical measures are always more risky than in others, septic troubles and secondary hæmorrhage being readily lighted up. Moreover, the longer they are left the greater likelihood is there of the formation of adhesions around the gall bladder which will add considerably to the dangers of subsequent operations. When a patient is suffering continually from biliary colic, when jaundice is well marked and resistant to treatment, when a tumour can be felt, when obstruction is present owing to ileus of or traction upon

the neighbouring coils of intestine, or when suppuration within the gall bladder is threatening, as indicated by the presence of a localised peritonitis in the right hypochondrium—under any of these circumstances surgical assistance ought to be called in. A large amount of material has been published during the past year dealing with this subject, and it is only possible here to refer to some of the more prominent pronouncements. A prolonged discussion arose in the Surgical Society of Paris (*Bull. et Mém. de la Soc. de Chir. de Paris*, vol. xxii., pp. 245-439) in reference to a paper of **Tuffier's**, relating 14 cases in which he had operated with 11 recoveries and 3 deaths, only one of them due to septic peritonitis. He considers that ideal cholecystotomy —*i.e.* immediate closure of the gall bladder by suture after removal of the calculi—is indicated only in rare instances when the interior is healthy and the biliary passages evidently pervious. Several speakers were in favour of total ablation of the gall bladder whenever practicable. Thus **Michaux** pointed out that extraction of the calculi is not always an easy matter, as some of them may remain caught between folds of mucous membrane; septic infection may also arise, and the walls of the bladder are sometimes so friable as to tear on any attempt to introduce sutures. He also claims that statistics of this operation are quite as favourable as those of cholecystotomy, whilst the patient is saved from the dangers and inconveniences associated with the formation of a biliary fistula. **Schwartz** held that the patient must be fairly sound, the liver healthy, and the common bile duct patent if removal is to be attempted. **Monod** gave the following statistics from the experiences of his chief, Morin :—44 cholecystostomies with 4 deaths ; 14 cholecystotomies with immediate closure of the gall bladder, resulting in 2 deaths ; and 17 cholecystectomies, all of which recovered. From these facts he argues that closure of the wound with sutures is not advisable, and that as a general rule drainage should be undertaken; removal of the gall bladder must be resorted to only when it is in a condition of hydrops, with the cystic duct obliterated, and with the common duct free. **Reynier** added that such conditions were usually found apart from jaundice, and that if this symptom were present drainage is advisable. All the speakers admitted that after cholecystostomy recurrence of gall stones was very uncommon. **Mayo Robson** (*Brit. Med. Journ.*, March 13, 20, and 27, 1897), in his admirable lectures to the College of Surgeons, discussed the same subject *in extenso*. He considers that immediate suture is rarely called for except when, on account of the depth at which it lies, a contracted gall bladder

cannot be brought to the surface or even drained by the introduction of a tube; he thinks that the risk of the process is somewhat greater than that associated with the formation of a fistula. His conclusions as to removal of the gall bladder are very much the same as those mentioned above as held by Parisian surgeons. For an impacted stone in the common duct Robson describes all the many methods that have been suggested, but evidently seems to favour pressing the stone forwards or backwards with the fingers, combined perhaps with compression so as to break it up, but no instruments must be used to accomplish this; should this fail, incision of the duct is required if the condition of the patient or of the part permits it with any reasonable degree of safety; in other circumstances a fistula may be formed, and solvent injections subsequently utilised.

As to results of these gall bladder operations, the most extensive series published lately are those of **Hans Kehr** (*Archiv f. Chir.*, 1896, vol. liii., p. 362). He records 209 cases of laparotomy for gall stones on 174 different patients, of whom only 23 were men. Out of 127 simple operations on the gall bladder with immediate closure or drainage, only one patient died, and that an old man with pulmonary emphysema and arterial sclerosis. In 21 cases the gall bladder was removed with only one death. In 30 cases the common duct had to be opened or handled for impacted stone, and two deaths resulted. Other conditions accounted for the remaining cases, but of the 209 operations only 17 were fatal (8 per cent.), a most gratifying result. Relapses were uncommon; in only one case was there genuine evidence of this having occurred. In several instances stones were left behind in the common duct, and for these second operations were sometimes needed. Kehr's results for choledochotomy give a death rate of 6·6 per cent., whereas the mortality in other lists amounts to at least 22 per cent.

(See also an interesting discussion on this subject in the New York Academy of Medicine, reported in the *Medical Record*, April 24, 1897; and papers by **Duncan**, *Intercolonial Med. Journ. of Australasia*, Oct. 20, 1896; **Manière**, *Chicago Med. Recorder*, May 9, 1897; and **Beck**, *New York Med. Journ.*, May 8, 1897.)

ORTHOPÆDIC SURGERY.

By W. J. Walsham, F.R.C.S.,

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1. Treatment of Morton's disease or metatarsalgia. **Robert Jones** (*Liverpool Med. Chir. Journ.*, Jan., 1897). The author does not agree with Morton's theory of the compression of the digital nerves between the heads of the metatarsal bones, but believes that clinical observations accord much better with a theory of treading upon rather than with that of pinching a nerve. He is strengthened in this opinion by three anatomical facts: "(*a*) The proximity to the painful area of the communicating fourth branch of the superficial divisions of the external plantar; (*b*) the collapse of the anterior arch in most of the cases; (*c*) the bulk of superincumbent body weight in walking on the toes is borne on the first and fourth joints." From the persistence of pain in certain cases, even after pressure has been withdrawn, and from the immediate sensitiveness when walking is practised, Jones is inclined to believe that a neuritis of the plantar nerves involved exists in the more acute cases. This view he considers is confirmed by the fact that, even after a long rest, pinching the spot between finger and thumb gives rise to severe pain. Treatment must vary with the stage of the affection. In the first stage the affection should be prevented from further developing by (1) abstaining from continuing any action which produces the pain; (2) increasing the depth of the inner aspect of heel in order to produce slight inversion of foot; (3) wearing thick soles with well-fitting insteps, and roomy around the heads of the metatarsals; and (4) insisting that the sole be at least one-fourth of an inch thicker a little behind the bases of the metatarsals. These preventive measures should also be directed to the cure of the second stage, with certain additions—viz. (1) a thick bar placed about half an inch behind the metatarsal heads; (2) a band of non-irritating plaster around the instep; (3) massage of the foot with contrast baths of hot and cold water; (4) elevation of the foot of the bed at night-time.

The advantage of thick-soled boots is obvious; they prevent

excessive mobility at the articulation, and minimise sharp bony pressure upon the nerves. The boots should be roomy at the toes, not merely to give more room to the metatarsal heads but to allow freedom to flex the toes, and to perform other movements to avoid pain. The heel of the boot is slanted to correct the common tendency to valgus and to vary the pressure point. In a case where there is no collapse of the arch, the heel may with advantage be elevated on the *outer* side to deviate the body pressure. Most important of all, however, is the thickening of the sole in the early stages (or bar in later) behind the metatarsal heads. This gives rest to the articulation, even during the act of walking, and is of more advantage than any other mechanical detail of treatment. This alteration, even in the case of an inflamed or gouty toe-joint, allows the patient to travel in comparative comfort, and should always be prescribed in all stages of plantar neuralgia—for a time even in those cases where an operation has been performed.

Although advanced cases can be relieved by mechanical measures, Jones prefers excision of the metatarsal head to either excision of the joint or to amputation of the metatarsal head and toe. He performs it as follows :—After the part has been carefully asepticised, an incision should be made a little over an inch in length, starting above the metatarso-phalangeal joint, and extending over the middle line of the toe. The extensor tendon is divided, the capsule opened, and the head of the metatarsal dissected out by a blunt instrument. With fine bone nippers the head is removed and the flexor tendon below divided. The wound is then sutured, and, as a rule, no vessels need securing. The after-treatment consists in keeping the patient in bed for about ten days with the foot elevated. Massage should then be commenced, and the patient, with a bar under the boot, allowed to walk. There is usually nothing to hinder complete recovery in from five to six weeks, when the previously described boots should be prescribed.

[The reporter quite agrees with Mr. Robert Jones that metatarsalgia is not due to the nipping of the nerve between the bones. In several cases of Morton's disease that have come under his notice he has had skiagraphs of the feet taken, and the heads of the metatarsal bones were shown to be at such a distance from each other that the nerves could not be readily nipped between them.]

2. The treatment of hallux valgus.

Delbet (*Bulletin de la Société de Chirurgie*, 1896, No. 22), after he had removed the head of the metatarsal bone and

superimposed bursa, finding that the phalanx was still drawn by the extensor tendon into the valgoid position, freed the tendon, drew it into the wound, and fixed it to the metatarsal bone by a periosteal flap in such a position that it held the toe in a straight line instead of, as heretofore, deflecting it.

This little procedure is worth remembering should any difficulty be found in maintaining the toe in a straight line after excision of the head of the metatarsal bone, but the straight position, so far as I know, can always be obtained by removing sufficient of the head of the bone—a procedure which, I should imagine, would be more likely to have a permanent result than the fixation of the tendon by an artificial sheath.

3. The treatment of claw toes and pes cavus.

Davies-Colley (*Guy's Hosp. Rep.*, 1896). In all severe cases of claw toes and pes cavus, Davies-Colley removes a piece of the extensor proprius hallucis, and implants the proximal end upon the base of the first metatarsal bone. He makes an incision about 2 inches long upon the tendon over the tarso-metatarsal joint, cuts away 1 inch of the tendon, and fixes the proximal end to the metatarsal bone, about ½ inch in front of its base. The tendon is secured to the bone by reflecting two triangular flaps of the periosteum, beneath which, and in contact with the bone, the tendon is placed and secured by chromicised catgut sutures. Through the same incision he also divides the innermost tendon of the extensor brevis digitorum, and if the small toes as well as the large are clawed he further removes a portion of each of their tendons; but he does not attempt to stitch them down to their corresponding metatarsal bones because of the hindrance offered by the short extensor. He believes that when healing has taken place the extensor tendons act directly upon the front part of the instep and, consequently, that the incurvation of the toes is much diminished.

4. The treatment of Pott's disease.

Calot (*Bulletin de l'Académie de Médecine*, Dec., 1896); **Chipault** (*ibid.*, No. 3, 1897); **Ménard** (*ibid.*, No. 19, 1897); **Monod** (*ibid.*, No. 23, 1897); **Jones** and **Tubby** (*Lancet*, Aug. 7, 1897).

Calot rectifies angular deformity of the spine at one sitting in the following manner:—The patient is held by the arms and legs by four strong assistants. The surgeon applies his hands over the curve and presses vigorously upon the displaced vertebræ until they are forced into line with those above and below, or even beyond their level, the giving way of the bones being distinctly felt and heard. The patient is then immobilised in a plaster case, which is changed two or three times at intervals of three or four

months. He is then allowed to walk about in the case. Calot lays great stress on the proper application of the plaster case. In thirty-seven cases in which Calot has performed this operation the curvature was immediately overcome. All the patients recovered without any untoward symptom. Sufficient time, however, has not elapsed to judge of the permanent value of this treatment. **Chipault** practises the same forcible rectification as Calot, with this difference, that he applies a figure-of-eight ligature of silver wire to the bony apophyses corresponding to the curve, believing that this gives a better chance of maintaining the corrected position. Further, he immobilises the patient, not in a plaster case, but on a board. **Ménard** condemns forcible rectification, believing it dangerous and inefficacious. It is true that his experiments on the dead body show that, in spite of the dislocation of the column which follows forcible rectification, the marrow and the meninges remain intact; but on the other hand, in one case rupture of the membranes, which bounded a collection of pus at the axis of the curve, was produced; this in the living would have flooded the mediastinum. But the point upon which Ménard places most stress is that the forced rectification necessarily produces the separation of the two sections of the spinal column and the formation of a vast cavity, measuring, according to Ménard's experiments, 2, 4, and 6 centimetres. For cure to result it is necessary that this cavity should become filled by a bony callus. If this does not form, the fibrous cicatrix will yield when the plaster apparatus is left off. It is easy to see by *post-mortem* examinations and in musuem specimens that in Pott's disease the periosteum of the vertebræ is greatly altered and destroyed, and does not produce new bony tissue, nor does one find in patients who have been cured any hyperostosis either over or between the diseased vetebræ. These considerations lead Ménard to the conviction that the curvature will reproduce itself, and that it is better not to interfere.

In a *résumé* of these papers **Monod** sums up "that there are a certain number of cases that should not be touched—*i.e.* those where the separation following rectification would be such that consolidation would be impossible." This is especially the case where the hump has existed four or five years or longer. There are, besides, the risks of accidents, which in Calot's series were happily absent—*i.e.* rupture of adherent membranes, intra-rachitic hæmorrhage, lesions of the mediastinal vessels and intra-thoracic organs, and opening tuberculous cavities, with subsequent general infection. On the other hand, in some of the cases operated on by Calot the deformity had only lasted five, six, seven, and nine

months. In this class of case it appears that correction is very easily obtained, and apparently with great benefit to the patient. With regard to the intermediate cases where the curve had lasted two, three or four years, two of the patients shown by Calot, in whom the hump had existed from two to three years, could now walk about free of their jackets; on the other hand, in one of the operations performed by Ménard on the dead body, rectification produced a separation of more than 4 centimetres, corresponding to the destruction of three vertebral bodies; and in this child the affection had not lasted more than three years. Before operating, therefore, Monod concludes that it would be well toascertain the number of vertebral bodies that are destroyed; this number, according to Ménard, usually corresponds to the number of the bony apophyses that apparently belong to the pathological curve. If by this means one finds that the cavity produced by the rectification is sufficiently large to remain unfilled with callus, one ought not to operate even if the curve dates from less than three years. In the contrary case, one may operate even if the curve is of this duration.

Jones and **Tubby** have recently treated eleven cases of angular deformity in this manner. In six of them immediate and complete reduction was gained. In two of these which were extremely deformed the reduction was very remarkable on account of the facility with which it was effected. In five of these eleven cases only partial reduction was obtained, but in two of these, being the first cases tried, sufficient force was not used; and the remaining three were so consolidated as to resist a large amount of force. The method followed was that of Calot except that, instead of assistants, a special apparatus was devised by which traction is simultaneously made on head, arms, and legs, after steady extension of the spine for a few minutes with the patient in the prone position, care being taken that the pull is equal in all directions. Downward pressure is made by the surgeon's hands in all directions, counter-pressure being afforded by the open palms of an assistant, placed on the abdomen. The patient's bowels should be well emptied before the operation, and then the assistant's hands readily support the anterior aspect of the spine, and so prevent too rapid reduction of the deformity. When the projection is dorsal, counter-pressure can be made through the chest walls. The plaster-of-Paris corset is then put on over the head (except the face) and neck as well, pressure being maintained during the application of the jacket on the site of the deformity. An important point is that the spine must be maintained in hyper-extension. No case was followed by paresis,

paralysis, or other bad symptom. In some cases a modification of the double Thomas's hip splint, with a head rest and leg support, was used, so constructed as to keep the spine in extension. In dealing with these cases the authors have experienced that the correct way of preventing deformity from arising or increasing in Pott's disease is to maintain the spine in hyper-extension by suitable support beneath it, and not simply to place the patient upon a bed or straight splint, which favours rugging of the spine at the site of disease, and increase of intervertebral pressure.

5. The rapid treatment of lateral curvature.

Teschner (*Trans. Amer. Orthop. Assoc.*, 1896) claims to have cured deformities of the spine in which bony and ligamentous changes and marked rotation are present by what he terms his "corrective method." This consists in the use of heavy dumb-bells and bars at each visit of the patient. The bells weigh from 5 to 80 lbs. each, the steel bars and bar bells from 26 to 111 lbs. The bells are pushed from the shoulders above the head alternately as often as the patient can. The patient is instructed to swing a heavy bell with one hand from the floor, above the head, and down again, the elbow and wrist being fixed and the motion repeated as often as possible in a systematic manner; then with the other hand the same number of times, and later with both. This exercises all the extensor muscles from the toes to the head in rapid succession. When a heavy bell is pushed or swung above the head on the side opposite the scoliosis, the action of the back muscles to sustain the weight and equilibrium is such as to cause the curved spine to approximate a straight line. A similar result is produced when a heavy weight is held by the side of the erect body on the scoliotic side, the arm being at full length. When a heavy bar is raised above the head with both hands the patient must fix the eyes upon the middle of the bar to maintain an equilibrium. This necessitates the bending of the head backward, the straightening and hyper-extending the spine, and consequently correcting a faulty position with a weight superimposed. The heavier the weight put above the head, whether with one hand or with two, the more the patient must exert herself to attain and maintain a correct or an improved attitude in order to sustain the equilibrium. Hence, the greater the weight the more forcible the actions of the muscles become, and the greater the temporary reduction of a deformity. It is by means of frequent and forcible temporary reductions of deformities by voluntary muscular actions that we can hope to improve, and do improve, those cases which are amenable to any form of active treatment.

When a patient, lying supine on the floor, raises a heavy bar above the head so that the arms are perpendicular to the floor, the weight of the bar, the position and weight of the body, and the action of the muscles tend to broaden the entire back and shoulders, and a slow downward movement tends to widen the entire chest, and most markedly the shoulders. The frequent repetition of the upward and downward movement plays an important part in the rapid development of the chest and back. Pushing the bells above the head, swinging them with each hand separately and with both hands together, raising a bar above the head, standing and lying down, and the exercises before enumerated constitute one day's work. Most patients can well stand three treatments a week, and each record must be improved upon at each succeeding visit. In mild habitual cases improvement in deportment is noticed within the first two weeks. In these cases two months' treatment usually suffices to effect a complete cure. In the more severe cases it is not and cannot be expected that such rapid results will be obtained, but a certain appreciable improvement is effected, and the amount of improvement depends upon persistent continuance of the treatment. Where there is a fixed rotation of long standing, with bony and ligamentous changes, the prospects are not so good; but even in those cases Teschner affirms that there has been considerable improvement in their conditions.

The weight treatment of lateral curvature is no doubt a most useful one in suitable cases, but it is not a panacea. Where there is much rotation, with osseous and ligamentous changes, I have found it, like all other forms of treatment, of little use, except in so far as it strengthens the muscles generally and improves the patient's general health.

6. The treatment of congenital dislocation of the hip.

Elliott (Section of Orthopædic Surgery, New York Academy of Medicine, April, 1897; *Revue d'Orthopédie*, Sept., 1897) showed a child of twenty-two months on whom he had operated by the bloodless method of Lorenz—*i.e.* reduction and bringing down the head near the acetabulum, the formation of a new cavity by manipulation, and the fixation of the thigh in a plaster case in a position of abduction of 90°, the child being allowed to get about.

Myers (*ibid.*) has obtained a very good result in a child three and a half years old by Paci's method—namely, forced extension, flexion, and forcible drawing downwards. Considerable force was used in order to bring about inflammatory adhesions. The limb was immovably fixed at an abduction angle of 30°,

the bandage was changed several times in the course of six months, and at the time the report was made the child could walk about with a movable apparatus and a shoe raised on the sound side. **Townsend** (*ibid.*) gave it as his opinion that after the open method patients still walked lame, and the dislocation often returned. On the other hand, the new methods still wanted their proof. **Sayre** (*ibid.*) had only seen one case where the hip could have been completely reduced by Bigelow's method.

Whitman (*ibid.*) had operated on three patients by Lorenz's method, and had found the great advantage of placing a weight of 25 to 30 lbs. upon the limb for three weeks before the operation.

7. The treatment of spasmodic torticollis.

Walton (American Neurological Association, May 5, 1897; *Medical News*, May 22, 1897) thinks that treatment other than operative is ineffectual is well established. The only operations to be considered are resection of nerves and section of muscles. Operations are generally too limited rather than too extensive. In most cases it will be necessary to resect the spinal accessory and the first three posterior branches of the cervical nerves, and generally wiser to cut the affected muscles. Muscle section alone has given good results, but there is no reason to abandon nerve resection.

Leszynsky (*ibid.*) has treated the affection successfully by increasing doses of atropine injected into the spasmodic muscles. In a case where this treatment could not be carried out on account of personal idiosyncrasy the clonic spasm was absolutely cured by rest, tonic treatment, local massage, passive movements, and gymnastics. A remittent tonic spasm, however, persisted.

8. The treatment of congenital torticollis.

Brackell (Meeting of the American Orthopædic Association, Washington, May 4, 1897; *Medical News*, May 22). The structural changes in the ligaments, muscles, etc., should be overcome by stretching or by massage. When the head was put up in over-correction it was continually stretched, but in selected cases one could depend upon the intermittent traction resulting from active massage and exercises. A roll should be placed under the neck of the patient, who should lie with the head turned to the opposite side in such a way as to cause over-correction of the deformity. In that position deep massage should be practised on the corrected structures and on the trapezius of the opposite side. The next step was to make up to the point of tolerance forcible manipulations, depressing the head, etc. In the next place, the head being held as nearly in the correct position as possible, the patient should be required to do heavy work with

dumb-bells, the muscles being made to work in their long arc instead of the short one.

Hubbard, in the discussion that followed, said he had treated a recent case by the open incision, dividing the sterno-mastoid in the middle, and also the trapezius and all contracted tissues; then he stretched the parts under ether, and put the head up in plaster-of-Paris in the over-corrected position. The plaster was removed in ten days, the wound having healed, and parts further corrected before it was reapplied. The patient was subjected later to manipulation. He thinks that stretching and massage are very important factors.

Shaffer thought that certain cases of torticollis could be relieved by systematic massage and intermittent traction, the great difficulty being to get the proper points for extension and counter-extension.

9. The surgical treatment of spastic paralysis in children.

Jackson Clarke (*Lancet*, 9, 1897); **Ketch, Sayre, Shaffer,** and **Taylor** (New York Academy of Medicine, Feb. 19, 1897); **Lorenz** (*Wien. klin. Rundschau*, 21-26, 1897).

In those cases where the intellect is unaffected and the spasm is limited to the leg with resulting talipes equinus, equino-varus, or equino-valgus, and the uselessness of electricity, massage, and retentive apparatus has become evident, **Jackson Clarke** advises that every resisting tendon should be completely severed and the limb fixed in an over-corrected position, and so left for four or five weeks. It is then found that the tendency for the deformity to return is greatly diminished and walking is again possible. If the patient is intelligent, this tendency may soon be entirely overcome by the exercise of the will, so that retentive apparatus may be dispensed with in the day, and at night only a light and simple shoe may be required to render the cure a permanent one. The contra-indications to the operation are much impairment of the intellectual faculties or the presence of chorea, epilepsy, or general rigidity. The paraplegic form of spastic paralysis is the most amenable to treatment, especially when the chief part of the disability consists in spastic club-foot. At the Section of Orthopædic Surgery in the Academy of New York, **Ketch, Sayre,** and **Taylor** agreed that tenotomy was advisable in these cases, in that it produced a diminution in the spasms. Taylor would extend the operation of tenotomy to adults. **Shaffer**, however, considered that it is only indicated where the spasmodic contraction has terminated in permanent contractions, and after the intellect has improved. He thinks better results are obtained by waiting

for this than by early interference. **Lorenz** not only advises tenotomy but the actual excision of portions of the affected tendon. In the case of spastic contraction of the knee he advises forcible straightening after 1 to $1\frac{1}{2}$ inch of the hamstring tendons has been removed. Reunion of the divided ends has always occurred. For severe cases of adductor spasm he recommends the excision of a portion of the obturator nerve.

For many years now I have practised tenotomies for spastic paraplegias, and with the best results; but I cannot conceive the advantage of the removal of portions of the contracted tendons. After tenotomy I have always found the tendons retract, leaving a very considerable gap. Tenotomy of the adductors in the usual situation has sufficed without excision of the obturator nerve, after which one would imagine paralysis of the muscle would ensue.

THE SURGICAL DISEASES OF CHILDREN.

By Edmund Owen, M.B., F.R.C.S.,

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1. Osteotomy of the femur as a treatment for tuberculous disease of the hip in its early stages.

R. F. Tobin deals with this subject in the *Brit. Med. Journ.*, April 14, 1897. He begins his paper on what he calls a new departure in the treatment of hip-disease, with the incontrovertible statement that the problem of cure is narrowed into one of giving rest to the joint, combined with constitutional treatment.

With regard to the treatment by weight and pulley, he says: "This appliance does not act in the way it is represented as doing in the plates in handbooks of surgery. In these you see a patient, with a weight attached to the leg, lying supine, his back and knee flat, and both touching the mattress. What happens in reality is this. If the weight is heavy enough to keep the leg straight, the spine is dragged into a position of lordosis; if it is less heavy, there is less straightness of leg and less lordosis; in each case the lordosis is an indication of force exerted on the joint, to its discomfort."

This is true in very many cases, but if a surgeon understands the proper method of applying the stirrup and weight in the case of a flexed thigh, he is careful to keep the thigh and leg duly raised upon a soft inclined plane, or upon a thick wedge-shaped pillow, so that the traction may always be *in the axis of the femur*. In this way the flexion is in due course corrected, the loins always lying flat upon the mattress, and the pelvis being squared. And when at last, by patient and gentle treatment, the limb is brought down and the body is straight and flat, the case is ready for the artist to make a drawing for the hand-book. If, however, his pencil is set to work upon the limb and the weight and pulley whilst the irritable muscles are still holding the femur rigidly flexed upon the pelvis, and the extension is along the level of the

top of the mattress, the characteristic feature of the sketch will, or, at least, ought to be, the arching of the loins.

Tobin remarks that Thomas's splint leaves something to be desired in the treatment of hip-joint disease. And I think that almost every hospital surgeon will agree with him in the following opinion: "I am ashamed to say how many patients I can recall whom I have treated for two or three months in my wards with a weight and pulley, and fitted with a Thomas's splint, who were then unavoidably discharged and lost sight of for a time, and who at a later period turned up with a suppurating joint, due in part, no doubt, to the Thomas's splint having been thrown aside as soon as it had got in any way awry."

[**Arbuthnot Lane** has lamented the want of originality of surgeons in the treatment of hip-joint disease. He says (*Clin. Journ.*, Oct. 20, 1897, p. 402):—"I think I will be able to show you at the present time that treatment is founded upon our habits of imitation or mimicry of one another's surgical procedures, rather than upon any well-understood scientific mechanical basis."]

Tobin, then, dissatisfied with the result of the orthodox but humdrum treatment of hip disease, says:—"I have, in the early stages of the disease, done an osteotomy of the femur on a level with the lesser trochanter (Gant's operation), and put the limb in a straight position as regards the body generally, leaving the upper fragment to retain its position of ease."

During the osteotomy, to prevent jarring of the joint, a large moist sandbag is made to support and steady the bone on its inner aspect, the patient lying on the sound side, with the affected limb drawn well in front of its fellow. In this position, with a sandbag of suitable size and shape, an assistant can, by depressing the knee, divert all concussion from the joint. The osteotome is made fully to divide the bone. The patient is then turned on his back, and while an assistant keeps the spine in contact with the table by flexing the sound thigh on the abdomen, the affected one is brought down till the posterior surface of the knee is also in contact with the table. To guard against abduction or adduction both limbs are "dressed" (using the word in its military sense) by a straight rod resting transversely on the anterior superior spines of the ilii.

The wound in the soft parts is partially closed, and a gauze aseptic dressing applied. The limbs are then fixed straight and flat in a box-splint.

"The patients to whom I consider this treatment applicable are cases in which there is no real shortening, in which there is no indication of suppuration, and in which the thigh on the

affected side (the patient lying on his back, and lordosis guarded against) makes an angle of thirty or more with the bed.

"In very late cases, where suppuration is present, the operation is barred by the danger of sepsis."

Mr. Tobin says that this line of treatment commends itself to him because he knows that "unrest is fatal" to the cure of joint disease. He submits his paper "rather with a view of illustrating the plan of treatment employed than of proving its utility, and with no suggestion that anyone should use it who is getting good results by other means."

Coming from so able and enthusiastic a surgeon as Mr. Tobin, this conclusion strikes one as half-hearted, halting, and diffident. It has not convinced its author, and I feel sure that it will fail to carry conviction to his readers. At least, I hope so.

All surgeons will agree with Mr. Tobin in this, that what the diseased hip needs is complete rest, and most of us think that by fixing the trunk and the limb in a Thomas's splint we manage to obtain it. But, in one way or another, the limb must be kept quiet. Tobin effects it by dividing the femur, and his paper shows that he does this somewhat early in the course of the disease—at that stage, in fact, in which the treatment by Thomas's splint may be expected to bring down the limb with ease and certainty; for, gradually, under this gentle treatment, the femur does come down straight and flat.

Amongst Mr. Tobin's "conclusions" we find the following:—

"That a large proportion of cases of this disease, especially those in which flexion has occurred, go on to suppuration, and that one of the chief causes of their doing so is the difficulty of giving the joint rest.

"That much of this difficulty lies in the fact that the position of greatest ease for the tuberculous hip-joint is one in which it is very awkward for the patient to carry the limb, very difficult for the surgeon to fix it, and therefore one in which the joint is constantly exposed to disturbance.

"That it is possible, and in many cases advisable, to remove this difficulty by such an osteotomy of the femur as will allow the limb to be put straight, while the upper of the fragments retains 'the natural position of rest.'"

A serious, and, I should think, an insuperable objection to the osteotomy treatment of hip-joint disease is that if, when the limb is obstinately flexed to a right angle, inverted and adducted, the bone is divided, and the femoral shaft is brought down flat and straight, the cut ends of the bone will be so far asunder that either non-union will follow and the child will be left with a flail

limb, or else that union will take place at such an angle that the inevitable shortening becomes greatly intensified.

2. Amputation at the hip-joint.

A considerable amount of attention has of late been directed to the best method of performing disarticulation of the femur, especially with a view to limiting the loss of blood, and to diminishing to the utmost the amount of the inevitable shock. The old showy operation by transfixion, as performed by Liston and other masters, with a bulky anterior flap is, I think, a thing of the past, though it is still described with other obsolete procedures of a like nature in modern text-books.

Davy's lever for compressing the common iliac artery through the rectum was an ingenious suggestion, but its use in the adult was found to be not free from danger, while in the case of a weakly child it would have been extremely hazardous.

In former years, when amputating at the hip-joint in a thin child, I have occasionally had the circulation effectually controlled by backward pressure upon the anterior wall of the abdomen, just below the umbilicus—the flow through the aorta being thus easily and completely controlled.

Chalot, Professor of Clinical Surgery, Toulouse, has recently advised (*Huitième Congrès de Chirurgie*) direct compression of the common iliac artery, made through a small opening above Poupart's ligament, with the view of effectually controlling hæmorrhage in disarticulation at the hip-joint. I cannot think, however, that such a procedure is advisable, more especially when, as so often happens, the limb is being removed for chronic septic disease.

In the *Annals of Surgery* (Feb., 1897, p. 129) is published a paper read before the New York Surgical Society by **Wyeth**, in which he once more directs attention to his method of controlling hæmorrhage in amputation at the hip-joint by means of two steel skewers which transfix the limb, and by rubber tube tourniquets, which tightly encircle it above the pins. The great feature of this method is that slipping of the tourniquets is impossible, and that practically every vessel is subjected to its compression. The paper is well illustrated, and those who are not familiar with Wyeth's method, and are liable to be called upon to disarticulate in cases in which hæmorrhage would likely be disastrous, would do well to refer to the *Annals* for February, 1897. I may say that I have adopted Wyeth's plan in disarticulating according to Furneaux Jordan's method, and am bound to speak well of it.

In the *Centralblatt für Chirurgie* (Feb. 20, 1897, p. 185), **Oscar Wolff** gives an interesting report of a case of chronic tuberculous

disease of the hip-joint, in which he not only removed the limb, but the chief portion of the carious os innominatum. He began by tying the iliac vessels—a very necessary precaution, one would think. After the operation albumin quickly disappeared from the urine, and the patient made an excellent recovery.

3. Knee-joint disease.

At the Congress of American Physicians and Surgeons which was held at Washington in May, 1897, the treatment of deformities of the knee, the result of tuberculous disease, was discussed. From the report of the meeting which is given in the *Medical Week* (May 28), I find that for correcting the characteristic threefold displacement of the tibia in advanced disease an instrument known as the "genuclast" is somewhat widely used.

Early in the course of the disease the head of the tibia becomes displaced backwards, and in this position, sometimes even on the back of the femoral condyles, it is firmly held by the contracted ham-strings, popliteus and gastrocnemius, as well as by the shortened posterior and lateral ligaments. Brute force, such as would be brought to bear, I suppose, by the "genuclast," might have the effect of effacing some of the flexion, but, I would maintain, with so much risk, that its employment could not be justified. I have no fear in admitting a very strong conservative prejudice in this matter, nor in confessing that I have no personal experience with the method in question. In the application of force to the contracted knee of the tuberculous child something must needs give way, and if, during the process, it happened that the head of the tibia glided forward to its proper place beneath the femoral condyles, the gain would be considerable. But long before the impatient and aggressive spirit of modern measures gave birth to the "genuclast" it was known that rough interference with a deformed, tuberculous knee could not readjust the articular surfaces.

According to the report before me, five surgeons gave their experience :—

Goldthwait (Boston), who introduced the subject, said that one of his first cases operated on was a young girl. "Failing to reduce the deformity with the genuclast, I opened the joint and removed the patella. It was then easy to bring the bones into place. The convalescence was tedious, and the joint remained quite sensitive for about two years." My friend **Dr. Ridlon** (Chicago), whilst attempting to reduce the deformity of the knee in one case, produced a large rent in the soft parts behind the knee. **Gillette** (St. Paul), in one case, "met with paralysis—loss of sensation—below the knee" (probably from injury to the popliteal

nerve). **H. A. Wilson**, when using the genuclast, fractured the femur a little above the condyles—though he did not think that he "was using excessive force." **Gibney** (New York) said that he was accustomed to use considerable force, but that it had often been impossible to secure a good position. He therefore urged the adoption of subcutaneous osteotomy of the femur above the condyles, in order to correct the deformity.

Had it been my good fortune to be present at that meeting, I would have ventured to urge in these cases the patient employment of Thomas's knee-splint, with which great improvement in the position of the deformed limb can be slowly and gradually accomplished. When the disease has then absolutely passed away, the deformed joint is found either synostosed or capable of a certain amount of movement. If the latter, a supra-condylar osteotomy, as advised by Gibney, should be resorted to. But if the joint be solidly fixed, the improvement in position is to be secured by the removal of a wedge-shaped piece of bone from the part at which femur, patella and tibia are fused together. It is a simple and a highly successful operation.

In connection with the rough manipulation of a tuberculous joint, I may here remark that at a meeting of the Société de Chirurgie, held in Paris, May 26, 1897, **Ménard** (Berck-sur-Mer) expressed an adverse opinion upon the forcible straightening of the spine, the hip, and the knee in deformity following on tuberculosis. In five cases under his observation, in which the flexed femur had been forced down into the straight line, tuberculous meningitis followed in a short while.

In the discussion upon hip-joint disease before the Société de Chirurgie, at Paris, June 23, 1897, **Gérard-Marchant** said that he had been watching for some years a case of tuberculous knee which was doing well. At last the joint grew painful and became flexed. He forcibly straightened the limb under chloroform, and fixed it in gypsum splints; tuberculous meningitis ensued, and his patient died. He said that death thus occurring in a comparatively healthy child had left a deep impression on him.

4. Clinical observations upon the use of antitoxin in diphtheria.

Joseph E. Winters, who last year read a paper on this subject before the Academy of Medicine of New York, is Professor of Diseases of Children in the Medical Department of the New York University. This suffices to show that he understands what diphtheria is, and that, more than most people, he is anxious to be provided with a sure remedy against it. He has

weighed Behring's antitoxin in the balance of clinical experience, and has found it not only wanting but harmful.

Winters says:—"Behring's antitoxin was given to the world as a specific against the toxins of the diphtheria bacillus; it has no action on the bacillus, it is not rendered less virulent, it is in no way influenced by the treatment. Behring has told us that his remedy has no influence on the poisons of other bacilli. Diphtheria in man scarcely ever occurs from pure infection by the Loeffler bacillus. Almost invariably we find in addition to the specific diphtheria bacillus, streptococci, staphylococci, etc. The poisonous substances of the latter bacilli are in no way influenced by antitoxin."

Winters concluded his paper by saying:—"With reference to a 'prejudice,' it is monstrous to speak of it—a prejudice against anything which could do any good in such a disease as diphtheria! A man who would have a prejudice against a specific for diphtheria should not be allowed to practise Medicine. If there is a specific for diphtheria, I want it. Could I have found that antitoxin did not do any harm, even though it was valueless in the treatment of diphtheria—even though it did not reduce the mortality—I would never have said anything against it. It is because I believe that it is dangerous that my convictions compel me to speak. The time will come, gentlemen, when every member of this Academy will feel with reference to it as I do to-night, and you will come to it from conviction, as various members have already."

Certainly, the perusal of the paper should render the more enthusiastic disciples of Behring cautious in their recommending the use of antitoxin as a *prophylactic*. In one such case the verdict of a coroner's inquest ran to the effect that the cause of death was the injection of diphtheria antitoxin.

In this paper there is a considerable collection of similar reports; I will, however, content myself with quoting one only. **Alfoldi** relates a case of a girl, three years old, who received a preventive injection of two cubic centimetres of Behring's serum, January 16. January 18 her temperature rose to over 104° F. On the 19th there were severe albuminuria and hæmaturia, petechiæ appeared over the whole body, and on the twentieth day the child died. Alfoldi attributed death to anti-diphtheritic serum.

"The resident physician in the diphtheria ward of the Children's Hospital at Strassburg said to me during my visit there last year: 'I have seen three children who, I think, were killed by the serum.'"

MacNeal and **Heywood**, of Illinois, say (*Pediatrics*, Feb. 1, 1897) that they are convinced that there would be fewer fatal cases from the use of antitoxin if we were to consider carefully the condition of the patient before the injection is made. "It is glaringly unfair to claim that the last straw broke the camel's back. What is the degree of poisoning? How is the heart? How is the nervous system? If the patient is very drowsy from sepsis, wake him up with a good full dose of strychnia."

Per contra, in the Harben Lectures upon the bearing of recent bacteriological investigations on public health, **Sims Woodhead** maintained that in those cases in which nerve and muscle changes have taken place before the toxin is neutralised by an antitoxin we may expect evidence of these changes to make their appearance. The fact that a number of cases recover which under the old methods of treatment would have succumbed at an early stage of the disease, must lead us to expect that the number of cases in which paralysis is present may even be increased; these paralyses and other complications must be attributed to their proper cause, the toxin, and not to the remedy, as has been by many inconsequently done.

He said that as to the results of the treatment, it has been found that in the hospitals of the Metropolitan Asylums Board the percentage mortality, as a whole, has fallen from 29·6—the lowest previously reported—to 20·8. Of the cases that came under treatment on the first day the death-rate has fallen to the remarkable figure of 4·7 per cent., as compared with 22·5 per cent. in 1894. For the five years 1890—1894 the mortality amongst the post-scarlatinal cases was slightly over 50 per cent., while now that most of these cases are treated by antitoxin the mortality has fallen to 5 per cent., although the mortality amongst the cases treated on the fourth or fifth day and later is over 40 per cent. Amongst those treated on the first day it is 2·8 per cent. Taking those treated with antitoxin only, the mortality is 5·7 on the total and 2·3 on the first day; indeed, out of 250 cases treated at once only six died.

Dr. Woodhead concluded by alluding to the serious responsibility incurred by those who were antagonistic to the new treatment.

And in the debate upon the antitoxin treatment at the New York Academy of Medicine (Dec. 10, 1896), **Henry F. Koester** said that he had seen such good results from the antitoxin treatment that he had come to look upon the physician who did not employ it as guilty of criminal neglect.

What impresses me much in connection with the diphtheria

antitoxin treatment is that the diagnosis of diphtheria is now more a question for the bacteriologist than the medical attendant—that the diagnosis is now made in the laboratory, and not in the ward or sick room. Though the presence of one swallow does not make a summer, the presence of a single Klebs-Loeffler bacillus in a specimen of viscid mucus, removed from a doubtful patch upon a boy's tonsil, suffices to warrant the bacteriologist in sending in the verdict that the angina is "diphtheria." And from this verdict there is no appeal. The child is therefore straightway treated with the antitoxin; he gets well, and the case is put upon the file as a success after, and therefore due to, the antitoxin treatment. Probably, had it not been for the report of the bacteriologist, the case would never have been considered one of diphtheria. Years ago most of these cases escaped recognition, though they might, nevertheless, have been the means of spreading the disease.

I am not, for a moment, finding fault with the autocrat of the laboratory, to whose conscientious work the practitioner, as well as the hygienist, is immensely indebted; but supposing that in the course of an epidemic he reported twenty such cases, how greatly would their inclusion have helped in the favourable consideration of the antitoxin treatment, and how usefully they would afterwards come to the hand of the statistician who is preparing his battery of columns and figures on the side of antitoxin! To me, personally, statistics are hateful things; and when they are applied to surgical matters they are more than apt to be misleading, not to say untruthful. To the antitoxin statistician the case of the slight sore-throat from which the viscid mucus was brought which contained the guilty bacillus—the object of his search—was just as much "diphtheria" as was a case in some other epidemic in which the child came under treatment with sloughing tonsils and toxæmic pallor. But, unfortunately, the compiler of statistics does not *weigh* his cases; he merely counts them. In these circumstances who can deem his method scientific or trustworthy? I certainly cannot. And sometimes, indeed, it appears to me as if the practitioner were, consciously or unconsciously, playing into the hands of the cold-blooded statistician by declining to give an antitoxin injection to a child who has diphtheria so severely that, in all probability, he is going to die from it, lest the death of the child should help to discredit the antitoxin. Surely no treatment could be established upon a sound basis if it stood in need of such mean support!

In what I have written, be it clearly noted, I have not said a word against a resort to the antitoxin treatment of diphtheria.

Indeed, I adopt it myself, and I urge its adoption by others; but, in the meanwhile, the practitioner should keep his mind open upon the question of the exact value of the treatment. Nobody can estimate yet with certainty. I believe that Behring said that he had provided us with the means of reducing the mortality from diphtheria to one-tenth of its former rate, that is, to about 3 per cent. We are yet, however, a long way from having reached this desirable consummation. But in the meanwhile let the bacteriologist continue to work on in enthusiasm and the practitioner in hope, and let them both beware of the statistician.

Then comes the question, What is a full dose of antitoxin? Hitherto the preparation of the material has been carried out in such a manner by its various dispensers, that when it found its way into the hands of the practitioner he knew practically nothing of its strength. So it happened that he might be injecting it in superfluity and in danger, or, on the contrary, might be using it in doses so small as to be inoperative either for good or evil. To remedy this unsatisfactory state of affairs, the Superintendent of the Laboratories of the Royal Colleges upon the Thames Embankment, Dr. Sims Woodhead, visited Germany in order to compare his methods with those in use in that country, and the following is extracted from his report on the subject:—"On my arrival in Berlin my first object was to obtain a comparison between our results in serum-testing and those by Professor Ehrlich. At the same time I carried out a series of dilutions according to the methods used in our laboratories. From day to day the reactions obtained in the different animals injected by Dr. Dönitz were noted and the experiments compared, and it appeared that our readings, obtained by the old method, differ to the extent of only about 5 per cent. from those obtained by the new method. Professor Ehrlich expressed the opinion that the serum he had examined for us was equal to any in the market. He also stated that our methods were thoroughly reliable. In this he was corroborated by Dr. Dönitz. They were greatly interested in the new method of preparing serum, and have determined to try it. In every case six samples are taken from large bottles containing several litres. These and the stock-flask are then placed under seal for future reference. The samples are tested as to the presence of micro-organisms; for the quantity of preservative material added, and for the number of units in each c.c. of the sample. If the strength does not come up to the standard it is returned. The new method of testing the serum with large

quantities of toxin is that now used, as it is sufficiently delicate to measure to within 1 per cent."

5. Intussusception.

It had not been my intention to refer again this year to the treatment of intussusception, but the subject is of such prime importance, and is, I am glad to say, now occupying so prominent a place in surgical attention, that I have little hesitation in so soon again considering it, and especially from the point of view of operative interference.

I do not propose to discuss the treatment of intussusception by inflation or injection, as I consider these measures to be always speculative, and sometimes dangerous, whilst if the invagination be in the small intestine they are certain to fail. Mr. **D'Arcy Power** remarked in his Lectures at the Royal College of Surgeons* that a pint of fluid had proved sufficient to rupture the bowel in a child aged three months, though the injection was made by one of the most careful and experienced surgeons in the profession. He goes on to say that the surgeon should keep one hand flat upon the abdomen whilst irrigation is being performed, and he must carefully avoid great variations of pressure. A sudden and uniform enlargement of the whole abdomen during irrigation raises a strong suspicion that the bowel has been ruptured, because rupture of the colon almost always takes place before there is any great distension of the small intestine, and that a laparotomy must be done at once when this accident happens.

It seems to me to be tolerably certain that if in any case hydrostatic pressure could reduce an intussusception, the same could have been effected by a small incision into the abdomen, and without subjecting the child to risk. Power truly remarks that a great disadvantage attends the use of irrigation for the cure of intussusception apart from the danger of rupture—namely, the liability to recurrence after reduction. Dr. F. H. Elliott has published the details of a case of recovery from intussusception in a child aged eight weeks, in whom recurrence took place twenty-four hours after the first reduction, five days after the second reduction, and thirteen days after the third reduction. Dr. Chaffey had a less satisfactory experience, for an intussusception recurred on five separate occasions until the patient, a boy aged three years, died of exhaustion. When recurrence is a feature in a case, it is better to open the abdomen at once.

Mr. Power concludes his remarks upon laparotomy by saying that the surgeon must then be prepared to deal effectually with

* *Lancet*, Feb. 13, 1897.

the conditions he may find, by such operative means as he can carry out with the least amount of shock, and in the shortest space of time that is compatible with the safety of the patient. This will be ensured if he uses the method with which he is the most familiar. But he should bear in mind that hardly a case can arise in which he is justified in closing the abdominal wound without at least an attempt to complete the operation by reducing or removing the intussusception. Such half-measures as the formation of an artificial anus are hardly ever justifiable, and the results obtained by them are disastrous. In the light of our present knowledge it appears that the use of a button or bobbin is most likely to give good results when enterectomy has to be done for an enteric intussusception, whilst Maunsell's operation is best adapted for the cure of ileo-cæcal and colo-colic forms of intussusception.

It is becoming a matter of increasing difficulty to keep pace with the reports of cases of intussusception which have been successfully treated by laparotomy in Britain and abroad, English medical literature being especially rich in them.

With regard to laparotomy for chronic intussusception (which is beginning to acquire a highly respectable position in surgical literature), reference may be made to a paper (*Lancet*, May 22, 1897, p. 1411) containing the report of a case treated by resection, and by Murphy's button by **Boyce Barrow.**

Whilst **Bernard Pitts** has reported seven consecutive cases of intussusception in infants treated by abdominal section, with six recoveries (*Lancet*, June 13, 1897, p. 1602). He truly remarks that (on account of delay) cases are almost hopeless from the first moment they are seen in hospital. A run of successful cases must depend either upon immediate treatment or the fortunate absence of severe damage to the bowel. Until the last few years it has been the practice to exhaust all other methods of treatment before abdominal section was resorted to, and it is not surprising that a successful case of surgical interference was most exceptional. Physicians, under whose care these cases are generally admitted, now employ inflation and manipulation, however, only when the patient is in good condition and has come very early under observation; they are satisfied that abdominal exploration should be undertaken without delay if complete reduction is not at once brought about. In all the acute cases recorded by Mr. Pitts the physician in charge requested the surgeon's immediate attendance, and to this saving of valuable time the successful results must certainly be attributed. Children under one year of age are commonly supposed to be unfavourable

subjects for abdominal exploration. With proper precautions, however, abdominal section may be performed without great risk from shock, but the temperature of the body must be maintained by wrapping the extremities in cotton wool, operating on a hot-water cushion, and taking care that the manipulations are carried out quickly and with great gentleness.

The first of Pitts's cases was that of an infant of eighteen months with chronic intussusception in which, reduction being

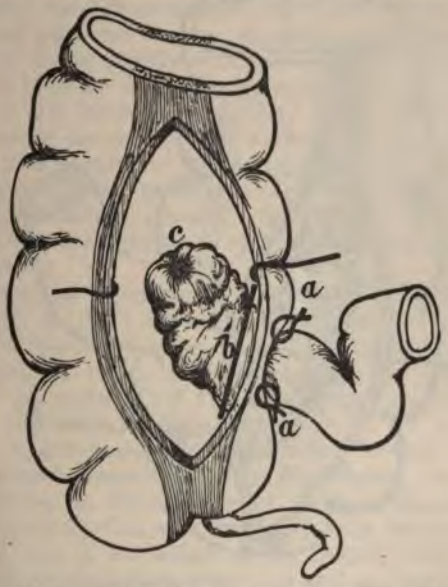

Fig. 1.—Cæcum laid open from the front to show ileo-colic invagination. *a* Sutures introduced round neck of intussusception. *b* Line along which intussusception was removed. *c* Apex of intussusception.

impossible, the invaginated part was removed through the colon, after Barker's method. The child made a perfect recovery (Fig. 1).

The second was one of chronic ileo-cæcal intussusception due to complete inversion of the appendix in a female child of two and a half years. The intussusception protruded four inches beyond the anus. Laparotomy having been performed, it was noticed that after apparent complete reduction no appendix was visible. At the position where it should normally be attached was seen a dimple; here also was the base of its mesenteric

attachment. On examination of the cæcum an elongated swelling could be felt within it resembling a thickened appendix. A vertical incision of two inches long was now made, having its centre at the junction of the cæcum and ascending colon, and a chronically thickened and completely inverted appendix was found. All attempts at reduction failed, so the appendix was cut away and its base sutured, and then further secured by

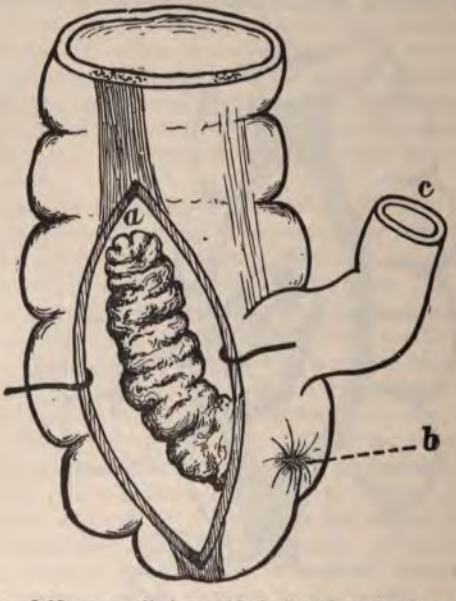

Fig. 2.—Cæcum laid open on its inner side to show invagination of the vermiform appendix. *a* Apex of invaginated appendix. *b* Depression in cæcum indicating attachment of appendix. *c* Lower end of ileum.

stitching the peritoneal coat of the cæcum over it. The incision in the large bowel was sutured and the abdominal wound closed. The child was kept under the influence of small doses of tincture of opium. Recovery was uninterrupted, but the child was kept in bed for a considerable time on account of the tuberculous condition discovered at the operation. The diagram shows the appearance after reduction of the intussusception and retraction of the sides of the incision in the large bowel (Fig. 2).

Pitts remarks that it is highly probable that some condition of irritation within the appendix caused it to turn inside out as

the first commencement of trouble; the inverted appendix thus acting as a polypus within the bowel, produced the ileo-cæcal intussusception.

Then follow five cases of acute intussusception in which successful results were secured by laparotomy—results which should go a long way towards placing prompt abdominal section in its proper position in the treatment of intussusception.

Pitts ends his valuable paper with the advice that if treatment by rectal injection is thought expedient, the surgeon should be *present* and prepared to open the abdomen at once if a satisfactory result is not quickly obtained. That in many cases the effect of such inflation is to reduce the main mass of the tumour, but to leave an irreducible portion. And that exploratory operation should be undertaken without preliminary inflation, when from the severity of the symptoms, or the chronicity of the case, there is reason to believe that such inflation would be dangerous or unlikely to succeed. And that it must always be remembered that the time taken up by the inflation adds considerably to the shock.

G. B. Morgan, of Sunderland, published (*Brit. Med. Journ.*, 1896, vol. ii., p. 847) the case of an infant of nine months with acute intussusception on whom he successfully performed abdominal section within twelve hours of the appearance of symptoms. He remarks: "The day is gone by when expectant treatment is justifiable in intussusception."

At the Carlisle meeting of the British Medical Association last year, **Crawford Renton** read (*Brit. Med. Journ.*, Oct. 17, 1896, p. 1113) "Notes on Three Cases of Acute Intussusception in which Abdominal Section was Performed, with Recovery."

One case was in an infant of ten months; one of eleven months; and one of three months.

This is certainly a delightful record. Mr. Renton truly says that there is nothing to be gained by delay, as almost every child dies if not operated on, but that it is relieved with speed.

From the Hartlepools Hospital comes the report of a case (*Brit. Med. Journ.*, July 10, 1897, p. 83), in which **T. G. Ainsley** successfully performed Maunsell's operation for an intussusception in a boy of fifteen years. When seen three days after the onset of symptoms the boy lay in a state of semi-stupor. He referred the pain to half an inch above the umbilicus. The abdomen was flaccid and slightly tender, but no tumour could be detected. Examination *per rectum* gave negative results. He vomited at intervals, but retained a good deal of food. On the third day he had some straining and passed a little mucus and blood. The

case was then diagnosed as one of intussusception, and it was decided to operate. Under chloroform an indistinct swelling could be felt through the upper part of the rectal wall. On the abdomen being opened, the intussusception was readily found among the coils of small intestine and brought out at the wound. The tumour was situated on the small intestine, some distance above the cæcum. On attempting reduction, it was found to be gangrenous. "I had now some hesitation whether to use a Murphy's button which was ready, or perform the resection known as Maunsell's. As the patient was bearing the operation well, and I looked with some suspicion upon Murphy's invention, the latter course was decided on. The intestine was clamped, surrounded by sponges, the tumour cut away, and the ends well washed with warm boracic lotion. The time occupied by the operation was one hour. The pulse was then 165; the temperature never rose above 100° F. The patient had a natural motion on the fifth day, and recovery was uninterrupted. He left the hospital three weeks afterwards, and is now, fifteen months after the operation, in perfect health."

Stanley Boyd showed in his clinique an infant of eight months (*Clin. Journ.*, June 2, 1897, p. 89), who had recovered after his performing laparotomy on her for acute intussusception. His house-surgeon had already endeavoured to reduce the intussusception by means of water-pressure. When Mr. Boyd examined the child the swelling was confined to the right side of the navel. He made a median incision above the umbilicus, and, inserting two fingers, was able to tilt the invagination through the wound. "After the operation the child did well, and we ceased to anticipate trouble. But one morning the temperature ran up to 104° without obvious cause, but the child seemed so well that we were never very anxious about it. The temperature fell after three or four days, and progress once more set in, but we had another slight and short rise a few days later, also unaccounted for. The wound healed by first intention."

Lawford Knaggs (*Lancet*, April 24, 1897, p. 1137), in an important essay, reports two cases of successful operation, in one of which reduction was easy of accomplishment after symptoms had existed for forty-four days. In Mr. Hutchinson's well-known case disinvagination was safely performed at the end of a month. But neither of these approaches the case recorded by Dr. Handfield-Jones and Mr. Page, in which an invagination was reduced after a probable duration of three months.

Doubtless I might have multiplied the number of reports of successful results of laparotomy in acute and in chronic intus-

susception, but little would have been gained thereby. What I wished to do was, like the fly on the wheel, to help in an important revolution, and to plead for early operation in these cases. I remember being called some years ago to a consultation on an infant who was *in articulo mortis* from acute intussusception. When the general practitioner—a very practical man—learned what my inclination was, he said that nothing would induce him to agree to an abdominal section, that he had seen several such operations, and that every one had ended fatally. The case under consideration looked so hopeless that I, with more discretion than valour, did not urge operation. Doubtless he was correct in his statement, and that in those sad cases which he had witnessed, laparotomy had been resorted to after valuable time had been fruitlessly expended, and the children's power of endurance wasted, by unsuccessful attempts at reduction by inversion and injection. And how, in such circumstances, could any other issue be expected? Laparotomy for acute intussusception should no longer be considered as an adjunct to inflation and injection; it should absolutely and entirely replace them.

6. Hernia of the ovary with twisted pedicle.

In the previous issue of the "Year-Book," p. 242, brief reports were given of two cases of hernia, with some symptoms of strangulation, in which an engorged ovary was found with a twisted pedicle in the inguinal region of a child. A resemblance between these cases and those of axial rotation of the testicle was then suggested. Such cases are sufficiently rare to be deserving of report in this article.

In the *Lancet* (May 15, 1897) **John H. Morgan** reports a case of right ovarian hernia with twisted pedicle which had been under his care in the Great Ormond Street Hospital a few weeks before. A female infant, aged eight months, was admitted on March 9, 1897, with a lump in the right groin; it was of interest to note that a brother had died from strangulated hernia. The infant had always been delicate, and ever since she was four days old a small swelling had been observed in the right groin. Four days before admission this swelling underwent great increase in size, the skin over it became red, and the parts appeared to be painful, the child screaming constantly and drawing up the right leg. She was convulsed on two occasions, but had not vomited, and the bowels were quite regular. On admission, the child appeared to be happy, and free from symptoms. The temperature was normal. Extending over the right external abdominal ring was a rounded, semi-elastic swelling, which was not altered in size when the child cried; pitting of the skin could be made out on

pressure. The child was fat, but an indistinct irreducible body could be felt, and could be freely moved about, having, as it seemed, no connection with the interior of the abdomen. Morgan made an oblique incision over the swelling, and exposed a thin-walled sac; an incision through this membrane allowed the escape of blood-stained fluid, leaving exposed a plum-coloured body about the size of a small damson. Attached to the upper end of this, which on closer inspection proved to be the ovary, was a pedicle twisted upon itself two and a half turns. This stalk consisted of the right Fallopian tube and the broad ligament, and upon pulling them outwards the fundus of the uterus entered the wound. The portion of the twisted pedicle, almost to its attachment to the uterus, was in a congested condition similar to that of the ovary. A ligature was passed round the pedicle, the ovary and pedicle were cut off, and the uterus was dropped back into the abdomen. A suture was passed through the external abdominal ring, and the surface-wound was closed. The child recovered without a bad symptom.

7. A fatal case of operation for tongue-tie was reported (*Lancet*, Jan. 22, 1897) by **Hamilton A. Ballance.** It occurred in the practice of a *sage-femme* at Norwich. Ballance says that the report may be of interest to medical men owing to the prominence of the "midwives question" at the present time. An inquest was held and the jury returned a verdict of "Death from misadventure." They also recommended that in future a medical man should be consulted should this operation be thought necessary, and they considered that the midwife was deserving of censure for undertaking it. At the inquiry the woman stated that she had frequently performed the operation before!

About an hour after the birth the midwife said that the child was tongue-tied, and using a sharp-pointed pair of scissors she proceeded to liberate it. She did not notice bleeding at the time of the operation, but on the same evening blood was observed to be issuing from the child's mouth. Next day, as the bleeding continued, the father went to the midwife's house and fetched her to the case. The woman told the parents that there was no need to be frightened. The hæmorrhage did not cease; and the midwife was therefore again fetched on the evening of the following day. She then washed the mouth and the face of the child in warm water. The father requested that a medical man should be called in, but the midwife said that it was unnecessary and that if she was to blame she would take the responsibility. Eventually, however, she took the child herself to a medical man, who, after examining him and giving directions

to the friends as to treatment, recommended that he should be taken to Mr. Burton. Mr. Burton found arterial bleeding in the anterior part of the floor of the mouth and placed two ligatures on the bleeding points. He then sent the child to the hospital. A cut was seen, half an inch long, at the junction of the tongue and the floor of the mouth and exposing the muscular substance of the tongue. The bleeding seemed to have stopped from the time of the application of the ligatures. The child died next morning. While in the hospital he passed some dark blood by the bowel, having apparently swallowed the blood as it exuded from the wound.

It would be interesting to know where the nurse obtained the knowledge which she deemed sufficient to justify her in performing a surgical operation. Possibly she had attended a course of semi-popular instruction on "Nursing"; perhaps she had enjoyed the advantage of a course of lectures by the matron of a lying-in hospital, or had even obtained the diploma of some obstetric association. But what would this all amount to? A lying-in nurse is none the worse for possessing a veneer of surgical knowledge—indeed, she is probably all the better for it—but if such an one is under the impression that this minimum of information is to equip her for active surgical practice she becomes a positive danger to the community. I am afraid that this Norwich midwife is not the only unqualified woman in England who considers herself to be a competent medical practitioner and who acts accordingly.

Another fatal case of hæmorrhage after division of a tongue-tie was reported to the *Association Française pour l'Avancement des Sciences* by **Reboul** (Aug. 9, 1897). The usual precautions had been taken before operating, and when the bleeding appeared obstinate almost everything was tried, but in vain. Reboul makes reference to another case under the care of **Ricken**, and attributed to the hæmorrhagic diathesis. He says that the operation for tongue-tie ought not to be considered destitute of importance.

NEW PUBLICATIONS.

A new edition of the "Surgical Diseases of Children," * by the writer of this article, appeared early in the past summer. The book is partly re-written and considerably enlarged, and it is now

* "Surgical Diseases of Children." By **Edmund Owen**, M.B., F.R.C.S., Senior Surgeon to St. Mary's Hospital, and to the Hospital for Sick Children, Great Ormond Street, and Lecturer on Clinical Surgery at St. Mary's Hospital. With 5 chromo plates and 120 engravings. Third edition, revised and enlarged, 21s. London: Cassell and Company.

taken out from the series of blue, clinical volumes. Though a sense of propriety prevents the writer from here setting forth certain improvements in this volume, it need not hinder his calling attention to the print of a Röntgen-ray picture of a case of tuberculous hip-joint, which is shown opposite page 424. The photogram was taken by Dr. John Macintyre, of Glasgow, and the print comes out with a clearness which apparently leaves nothing to be desired. It shows that the shortening of the limb in old hip-disease is due to several causes—to disappearance of the triradiate cartilage at the bottom of the acetabulum, and a resulting arrest of development of the os innominatum, to absorption of the head and neck of the femur, and to atrophic influence which has hindered the growth of the femur. In connection with this photogram Dr. Macintyre has remarked that the arrest of development of the os innominatum occurring in a female subject might have an important and prejudicial influence from an obstetric point of view.

"About Children"* is the title of a volume of under 200 pages by **Samuel W. Kelley**, containing a short course of Lectures given by him to the nurses in the Training School of the Cleveland General Hospital. The instruction thus imparted is just what it should be; it gives a general survey of the province in which the nurses' work is cast without imparting to them the delusive suggestion that if they digest and absorb what they are taught they may consider themselves competent to start as medical practitioners.

* *Medical Gazette* Publishing Company, Cleveland, Ohio, U.S.A., 1897.

DISEASES OF THE GENITO-URINARY SYSTEM.

By Reginald Harrison, F.R.C.S.,

Surgeon to St. Peter's Hospital.

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1. Renal surgery.

Albarran contributes an article (*Gaz. Méd. de Paris*, and *Brit. Med. Journ.*, Oct. 9, 1897) advocating the more systematic adoption of catheterism of the ureter in cases of hydronephrosis. This he considers should be the first step in the surgical treatment of this affection, the ureteral catheter being retained if the mere introduction of the instrument fails to continue to empty the kidney. Should nephrotomy eventually prove necessary, he has found that this preliminary shortens the duration of a fistula that may result on the same principle that a retained catheter will sometimes promote the healing of a sinus caused by a urethral stricture. Similarly he treats fistulæ connected with the kidney arising spontaneously.

The various valuable papers that have recently drawn attention to the surgery of the ureters, with special reference to their catheterisation, amongst which I would particularly mention that by **Howard Kelly** (*Twentieth Century Practice of Medicine*, New York, vol. i., 1895), clearly show that these tubes, though so small, permit of treatment much on the same principle as that applicable to the male urethra. Further, it should be noted here that in wounds of the ureter the restoration of the duct may be effected without necessarily sacrificing the kidney connected with it, as was formerly often the case. **Bovée** (*Annals of Surgery*, Jan., 1897) narrates a case of this kind in which a ureter had been completely severed in the course of a complicated abdominal operation. By splicing the cut ends of the tube, not only was the life of the patient saved but the permanent continuity of the duct established. For testing such a point as the latter, the use of the cystoscope can now be relied upon.

2. Exploration of the kidney for stone.

Hurry Fenwick, writing on this subject (*Brit. Med. Journ.*, Oct. 16, 1897), with special reference to an exposed kidney, observes:

"To obviate opening the kidney at all when no stone is present, and to render an incision on to a located stone more precise, I have lately been working with the Roentgen Rays from a 10-in. coil. These are thrown upon the exposed kidney (illustrated), and the viscus is then examined with a fluoroscope screen. Although the method has marked disadvantages for routine operations, I believe it may be of occasional value to those surgeons who can command the rays in private or hospital practice. Personally I should employ them when called upon to deal with a kidney which had been negatively explored before."

3. Retro-peritoneal uretero-lithotomy.

H. B. Robinson (*Brit. Med. Journ.*, Sept. 11, 1897) reports a case where, in a woman suffering from hydronephrosis of the right kidney due to the impaction of a stone in the lower part of the corresponding duct, this operation was successfully performed. Catheterisation of the ureters by Howard Kelly's method was first practised, and the diagnosis made. The duct was exposed by abdominal incision and the stone removed. The latter measured $1\frac{1}{2}$ in. in length and weighed 97 grains. It was composed mainly of oxalates. After the removal of the stone the ureter was stitched up by interrupted sutures. A somewhat similar case is reported in the "Year-Book" for 1895 as having been practised by **Cotterell.** Both may be regarded as indicating the progressive work that is now being done in connection with the surgery of this small but most important duct.

That an impacted stone in the ureter often escapes detection there can be no doubt. **Larkin** (*Liverpool Med. Chir. Journ.*, July, 1897) states that, in cases of suspected stone in the kidney, but where none was found by exploration, he was in the habit of turning the kidney out upon the loin and examining the whole length of the ureter by passing a probe along it into the bladder. On three occasions he had by this means detected a stone in the ureter. This is a precaution worth taking.

4. Operative treatment of exstrophy of the bladder.

Tietze (*Beit. zur klin. Chir.*, Band xviii., Heft i.; and *Annals of Surgery*, Sept., 1897) describes and illustrates his method of treating this deformity, which has been practised with some degree of success. The operation is divided into three stages, viz.: (1) Formation of a bladder, (2) repair of the urethra and penis, and (3) closure of the neck of the bladder with the object of making a complete urine passage from the bladder downwards. The first step consists in providing ample lateral flaps from the parietes by which the protruding bladder can be covered over. The wall of the bladder itself is then dealt with, and dissected

sufficiently free that it may be brought together as a hollow space. In doing so special care must be taken not to injure the ureters or the peritoneum. This being done, the inverted edges of the viscus are brought together with Lembert sutures of catgut, arranged if possible in a vertical line so as to preserve the natural outline of the organ. The lateral flaps are then united in the middle line with silver wire. The second part of the operation consists in making a lateral incision on either side of the urethral mucous membrane, and thus converting a groove into a tube by suturing with catgut over a catheter. The third stage completes the proceeding by the closure of the neck of the bladder in the interval remaining between the bladder and the urethra. This is done by means of two oval incisions and sutures. Throughout each stage the bladder is drained by a catheter, as any leakage of urine into the surrounding parts is liable to be followed by serious consequences. The original paper contains illustrations which are almost necessary in following the various steps and details of the operation. That this operation, when it can be completed in accordance with the author's plan, is an improvement on others that have preceded it, there can, I think, be no doubt. We have, however, yet to learn how far the bladder, thus so completely covered in and connected with the urine passage, permits of retentive control over its contents. The difficulty of effecting this has been experienced in all the plastic operations that have hitherto been devised. Though a comfortable water-way may thus be provided, and the patient's condition to this extent be improved, the formation of an efficient reservoir has yet to be attained.

Recognising the latter difficulty in connection with this deformity, I recently published the particulars of a case (*Trans. Med. Soc.*, London, 1897) in which I practised a proceeding from a different standpoint. It consisted (1) in the removal of one of the kidneys in a boy, aged 15, who was in a most miserable condition from the state of his abdomen, thighs, and legs, caused by the constant trickling of urine over them. Twelve months were then allowed to elapse to enable the opposite kidney to hypertrophy. And (2) after this interval of time, the transplantation of the inferior opening of the remaining ureter from the bladder to the loin. This was successfully done, and the boy was fitted with a bag, arranged somewhat like "a bustle," with which the urine was collected from the solitary ureter in the loin. I showed the patient at the Medical Society of London, and for six months whilst he was constantly under our observation he derived great comfort from what had been done, and he ceased to be an offensive

object. After he left the hospital, and the care and hygienic attention that the latter means, he fell into ill health and returned, to die very speedily of surgical septic kidney. There were many points in connection with this case of much interest relative to the treatment of this class of deformities which space will not permit me to refer to here. This method of proceeding was suggested to me mainly by seeing a patient going about in good health where all the urine was collected from a single lumbar urinary fistula, with but little inconvenience either to himself or others.

5. Resection of growths from the bladder.

Küster (*Verhand. der deutsch. Ges. für Chir.*, XXV. Congress, and *Annals of Surgery*, May, 1897) reports two cases of excision of growths from the bladder—a villous polypus, and an endothelioma—which was successfully practised through a supra-pubic opening. In the first case the growth, as it usually does, surrounded the orifice of the right ureter. The involved portion of the latter was removed along with the mucous membrane to which the growth was attached. The divided end of the ureter was opened up by an incision and fixed by sutures on either side to the mucous membrane. The latter also was brought together as far as possible by sutures. Cystoscopic examination four days later showed perfect healing, with preservation of the newly-made ureteral orifice, through which urine could be seen escaping. The bladder was left open for some days, and subsequently sutured. Cases of this kind illustrate the progress that is being made in the direct treatment of certain forms of vesical growth. The value of the cystoscope as an instrument of precision both before and after operation is well shown in this class of cases.

6. The operative treatment of enlarged prostate.

Erdberg (*Petersburg. med. Woch.*, No. 33, 1897), in reporting a successful case of double vasectomy for urinary trouble arising from prostatic obstruction, draws the following conclusions relative to vasectomy as compared with castration:—(1) The former is a less serious operation, and does not entail confinement to bed or the use of an anæsthetic; (2) it is unlikely to cause any temporary or permanent mental disturbance, such as not unfrequently follows castration; and (3) it is no barrier to the subsequent performance of castration, though the latter is not likely to prove successful if resection of the vasa fails.

Though it is now three years (1894) since I drew attention to the subject of this article in a previous volume of the "Year-Book," the position of matters is still surrounded with so much that is new in the way of experience and interest,

that it is not necessary to offer an apology for again referring to it.

The conclusions arrived at by Erdberg in preferring vasectomy to castration accord so entirely not only with my own experience, but with that of many others who have had some practical experience of these operations, that I have no hesitation in endorsing them. There can be no doubt that the operation of castration, however performed, is not only a serious and depressing mutilation, but one that is attended with considerable risk to life and mental activity, to say nothing of its liability to failure. On the other hand, the risks to which I have just referred in connection with vasectomy are undoubtedly considerably less, whilst the beneficial results obtainable are in no sense less than in the case of castration. There are, however, a few points upon which I laid stress in my Bradshaw Lecture at the College of Surgeons (*Lancet*, December 12, 1896), to which I should here like to refer. In the first place, it must be noticed that in bringing about prostatic atrophy, or inactivity, by section of the vasa it is through the medium of a double process, or rather by the induction of an atrophy by an atrophy. The testicles may then be seen to atrophy just as completely as if they had been removed; when this has taken place the prostate usually shares in the change. Hence, the effects of vasectomy upon the prostate are longer delayed and more gradual than when the testes are abruptly removed. The process varies much in its duration; though it commences from the time of operation, it may not be completed for twelve months, or even more. This is not very remarkable when we consider the years the prostate has taken to enlarge, and obstruct. In the second place, I would urge that the vasa be resected on two different occasions, with an interval of certainly not less than a week between the two operations. I have never seen any harm, either mental or physical, follow, when this rule has been attended to. On the other hand, simultaneous resection of the vasa is not free from danger on both of these grounds. The process of atrophy-induction, to be safe, must be gradual, and this cannot be said to be so in the case of simultaneous double vasectomy or castration. The future of vasectomy largely depends not only upon a careful selection of cases, but also upon the mode in which the atrophic process is induced. Amongst other articles on this subject which have recently appeared, I would draw attention to a very able one by Freemantle (*Guy's Hospital Gazette*, 1897), where the *pros* and *cons* of this extremely important question are carefully discussed and illustrated by cases.

7. Chronic contraction of prostatic fibres encircling the vesical neck, and its treatment.

E. Fuller (*American Journ. of Med. Sciences*, October, 1897) writes of this condition as one of spastic muscular contraction, which is often attended with very painful symptoms connected with the function of micturition.

The article is worthy of careful study in connection with the clinical aspect of many chronic spasmodic affections of the urinary organs. Civiale referred to some of these states under the title of "Contracture du Col Vésical." With regard to the treatment, it is observed: "The only remedy for chronic contraction of the prostatic fibres encircling the neck of the bladder, which in my experience has shown any favourable results, consists in thoroughly rupturing, or in cutting through, them. This can be accomplished by means of the finger or the knife, as the case may be, introduced through a perineal incision. Vesical drainage should be practised after the operation. Treatment such as this has been followed by complete disappearance of all subjectival symptoms."

The spasmodic grip these fibres are capable of exercising can be fully appreciated only in some of those cases where it has been necessary to adopt the practice here recommended through a median opening in the perineum. The success of the treatment by drainage is no doubt another illustration of the advantages connected with securing for the part that physiological rest which Hilton contended for in connection with many painful affections.

8. The treatment of some infections communicable between the testes and prostate by occlusion of the vas deferens.

Reginald Harrison (*Tri-State Medical Journ.*, U.S.A., May, 1897) draws attention to certain affections where these ducts are the mediums for the transference of the bacilli and micro-organisms of certain well recognised diseases, both in upward and downward directions. Urinary tuberculosis commonly commences either in the testis or epididymis, and then invades the urinary apparatus above by the migration of the bacilli along these canals. In the same way, inflammatory products from the bladder and prostate descend and produce orchitis and epididymitis. He illustrates the ascent and descent of these diseases and the practice he suggests by the following two cases:—(1) Three years ago, and shortly after I had published an article (*Brit. Med. Journ.*, Sept. 23, 1893) on division of the vas deferens, relative to prostatic hypertrophy, I saw a delicate-looking man with a strong tuberculous family history, with a nodule in his left testicle remaining after an acute gonorrhœa. This nodule was deemed to be

tuberculous, or likely to become so. The question then raised had reference more especially to the removal of this by operation, on the ground of its suspicious nature. The urine was healthy, and so was the opposite testicle and its tubes; nor was I able to discern any evidence of deposit, so far as the fingers could reach, either in the vas or the prostate. The patient, who had had some medical education, was anxious that either the nodule or the testicle should be removed. I did not feel disposed to recommend either course. Having regard to the fact that the disease appeared limited to the nodule, and that any infection would probably pass along the canal of the vas deferens, I proposed to excise a portion of the latter. This was done, and the wound healed in a few days. A year afterwards it was found that the testis and nodule had both completely atrophied. The opposite testicle had enlarged as a consequence of this, and no sign of tuberculous infection could be detected. The patient's health and sexual powers were unimpaired. (2) Early last year (1896) I saw a gentleman approaching seventy years of age, otherwise in good health, who, in addition to much prostatitis, repeatedly suffered from most painful orchitis in one or both organs, though sexual power had ceased for some years. He was dependent on the catheter, and these attacks had been going on for some months, almost entirely confining him to bed and preventing him attending to his business. I divided his vasa for him, with great relief so far as his prostatic symptoms generally were concerned. Since this was done, he has had no further trouble with his testicles; and this is the point I wish here more particularly to illustrate. I have tried various methods for resecting the vasa. The simplest appears to consist in rendering the vas superficial by manipulation and making a small incision over it. It can then be easily seized with a Spencer Wells's clamp forceps and brought to the surface, where it is cleaned by a little dissection and a blunt hook or aneurysm needle passed beneath it. A loop is included by a silk ligature, and the free portion removed by scissors. To ligature the duct is insufficient, it being necessary to resect a portion of it. After the loop has thus been removed, the stump is returned with the ligature cut short, and the little wound is then closed with a suture or collodion. Union usually takes place in the course of a day or two. In this way the operation can be performed quickly, almost bloodlessly, and under the influence of a hypodermic injection of cocaine, no general anæsthetic being required.

9. The sterilisation of urine by pyoktanin.

R. A. Stirling (*Australasian Med. Gaz.*, Sept., 1897) narrates a

case where extravasation of urine, consequent on a urethral stricture, was not followed by the serious and painful effects on the parts which usually follow this occurrence. For three days previous to this the patient had been taking 3 grains of pyoktanin three times a day as an urinary antiseptic. The operator, in performing perineal section, was surprised to find, though the extravasation was extreme, how comparatively little the part had suffered. He observes, "Pyoktanin is said to be one of the most powerful of antiseptics; and as the patient's urine had been completely sterilised by it for three or four days before the rupture, there can be little doubt that this accidental urinary asepsis explains the painlessness of so serious a condition, and the subsequent easy recovery."

Though recognising the influence that various agents have in exercising a controlling power of this kind upon the urine, and the sufficiency of the explanation that is here offered, it is interesting to observe that urine which is deficient in urea when it becomes extravasated, as I have elsewhere illustrated ("Disorders of the Urinary Organs," 3rd ed., p. 46), also fails to be destructive to the tissues by reason of the absence of the source from which the ammonia is evolved. In the instance I refer to, the patient was suffering from Bright's disease. Stirling's case is sufficient to render a further trial of pyoktanin as a urine steriliser desirable in view of such contingencies as urinary extravasation. It is referred to by Martindale as having a slight antiseptic power, but I have had no experience in its use.

The sterilisation of the urine by drugs and other means administered by the mouth has now become a most important branch of therapeutics, in connection more particularly with certain purulent affections, and other conditions likely to become so, of the urinary organs. Any further additions to such sterilising agencies as quinine, borate of magnesia, boracic acid, salicylate and benzoate of soda, sandal, and others that might be mentioned, will be welcome.

10. A new origin of urethral fistula.

Trekaki and **Von Erchstorff** (*Annal. des Mal. des Org. Gén.-Urin.*, 1896, and *Journ. of Gen.-Urin. Diseases*, New York, Jan., 1897) make an interesting contribution to the study of the bilharzia hæmatobia as a cause of urethral fistula, detailing the histories of seven cases. The fact has already been observed by **Harrison** ("Lectures on Diseases of the Urinary Organs," 4th ed., 1893) and by **Belleli** (*Gaz. d. Ospitali*, 1896) that this worm or its ova may give rise to the trouble. Unlike fistula consequent upon gonorrhœa or *traumatism*, these are, strictly speaking, not accompanied by

stricture. These fistulæ can be cured only by median perineal cystotomy and the introduction of a bladder drainage tube. The indurated tissues are at the same time opened up and scraped. The wound closes in from six weeks to several months. I am indebted to Dr. Mackie, of Alexandria, for several pathological specimens illustrative of this form of fistula.

11. A giant lithotrite.

Keegan describes and figures (*Lancet*, July, 3rd, 1897) an instrument for crushing stone in the bladder, which he thus designates.

It is intended for use, as the author states, through a lateral or median perineal cystotomy wound, and it will readily break up a hard calculus weighing between six and eight ounces. It is, in fact, an instrument for use in connection with the revived operation of perineal lithotrity, as I have described in a former "Year-Book" (1893). In most cases of this operation, it will probably be found that crushing forceps will break and evacuate the stone quicker and more conveniently than any form of lithotrite. This, at all events, is my experience in connection with some very large and hard stones which have been successfully dealt with in this way. I entirely agree with Keegan in his concluding paragraph: "I feel confident that the mortality which has hitherto followed suprapubic lithotomy in dealing with very large calculi occurring among men at the middle and advanced periods of life will be greatly diminished by carrying out a perineal lithotrity in such cases."

When we consider the extremely small mortality that now follows crushing operations for stone, no pains should be spared in keeping all calculi within this category by detecting them when they are in their initial state in the bladder.

DISEASES OF THE RECTUM.

By Alfred Cooper, F.R.C.S.,
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I. The treatment of hæmorrhoids.

With one or two exceptions, no novel method of treating this common complaint has recently been suggested, though contributions on the subject to various medical journals have been somewhat frequent. For the radical cure of internal hæmorrhoids opinions are divided between the ligature and the clamp with its various modifications. Very good results are obtained from both forms of operation; at St. Mark's Hospital it is rarely found desirable to adopt any other method than the application of the ligature. On the other hand, as will appear in the following summary, the use of the clamp is regarded with more favour in the United States.

In *Mathews' Med. Quarterly*, July, 1896, p. 220, **W. V. Laws**, of Louisville, Ky., after discussing the palliative treatment of internal hæmorrhoids, recommends the clamp and excision method, as devised by **S. T. Earle**, of Baltimore. Each hæmorrhoid is drawn out with a catch-forceps and the clamp applied near to its base, and closed as tightly as possible. The pile is then cut off; the suturing is begun at the distal end of the clamp, and is continued over and under the latter till the whole of the cut surface is included, but is not drawn tight. Then the clamp is loosened and withdrawn from between the suture, the ends of which are drawn sufficiently tight to bring the cut edges into apposition and to check hæmorrhage. The two ends are made fast by a knot in each, close to the mucous surface. The clamp is generally applied parallel to the long axis of the rectum, but it may be used in the opposite direction. Further details of this method are to be found in the "Year-Book of Treatment," 1897, p. 268.

Another form of suture-clamp has been devised by **W. Erwin**, of Walter's Park, Pa. (*Mathews' Quarterly Journ.*, April, 1897, p. 184). It consists of two arms bent at a right angle at the lower end; this bent portion, which is about an inch and a half long, is provided with a shoulder about a quarter of an inch high, and

perforated by five small openings; the shafts above the angle are pivoted and serrated to receive a ring which regulates compression and bleeding. After the usual preparation of the patient and dilatation of the sphincter, the pile is seized by the forceps and well drawn down; the clamp is then applied as near the base of the hæmorrhoid as possible, and the ring passed along the serrations until there is a sufficient amount of compression to control hæmorrhage. With a needle threaded with silk or catgut the pile is pierced through the needle-holes of the clamp. When the sutures are placed the pile is cut off with either knife or scissors, the sutures tied, and the clamp removed. The sutures are removed on the fifth or sixth day, when the wound is nearly healed. Should the stumps remain large, a weak solution of alum or tannic acid should be applied.

In the same journal, p. 183, **R. T. Morris**, of New York, advocates two methods of operating on internal hæmorrhoids: (1) Ligation and excision, or (2) excision of piles and suture of the incisions. With regard to other methods, he objects to Whitehead's operation because it removes the special rectal sense apparatus, the pecten dentations and papillæ. Moreover, if primary union be missed, contraction of the scar may cause grave complications. Injections he regards as dangerous, because of the possibility of septic infection. Slowness of healing after the clamp and cautery is the main drawback to that method.

In *Mathews' Quart. Journ.*, July, 1896, p. 225, **H. R. Coston**, of Tennessee, discusses three methods of curing internal hæmorrhoids—viz. by injection, by ligature, and by clamp and cautery. He thinks the first should be used only in cases in which the patient refuses to submit to more thorough methods. In his experience ulceration and abscess are very prone to follow, and relapse is almost sure to occur. The treatment is unreliable, and attended with pain and danger; it is the ideal operation of advertising charlatans and should receive no encouragement from the profession.

The operation by ligature is performed by Coston in the usual way; but he places the patient in the "extreme lithotomy position."

The same position is adopted for the clamp and cautery operation. Each tumour is caught with the tenaculum forceps, and an incision is made with the scissors at the junction of the skin and mucous membrane; the clamp is applied across the tumour, with the lower blade in the incision, and screwed down tightly. The top of the tumour is then cut off, leaving about one-fourth of an inch of stump above the blades; the cautery is

applied at a dull red heat, and the stump is burnt well down to the clamp: then the latter is unscrewed and removed, care being taken that the eschar is not detached; the stump is followed through the blades with the cautery. Small tumours may be simply burnt away with the cautery. If too large to be grasped by the clamp, the tumours should be split into parts, in line with the bowel, with the scissors, and each part treated separately. The risk of subsequent contraction may be avoided by not interfering with the healthy mucous membrane between the piles. The stumps are to be replaced within the bowel. The patient may be up from the third day, but should keep his room for a week.

Coston prefers the clamp and cautery operation to all others, and for the following reasons: (1) The nerve ends are cut away and cauterised, and rapidly become cicatrised; with the ligature the nerves are tied up, and more or less pain continues until the stumps slough. (2) There is no danger of secondary hæmorrhage after the clamp and cautery. If hæmorrhage occurs, it does so immediately. (3) There is no danger of recurrence. (4) Convalescence is much more quickly completed; for it begins at once under the eschar produced by the cautery, and would be completed by the time the ligatures come away should the two operations be used on separate tumours in the same case at the same time. (5) The mortality is practically *nil.* (6) The cautery method requires less care from the surgeon after the operation; and (7) There are no unpleasant sequelæ.

Coston has evidently been very successful with the clamp and cautery; he seems to be unaware of the fact that several deaths from hæmorrhage have taken place after this operation.

The preference given in the United States to the clamp and cautery operation is shown by an analysis of 700 cases of hæmorrhoids treated during the last eight years in the Mount Sinai Hospital, N.Y. (*Canadian Practitioner*, December, 1896, p. 872). **F. L. Vaux** states that 500 operations were performed by the clamp and cautery; about 125 by ligature, and some 75 by Whitehead's method. The following is the procedure generally adopted at the hospital: Ice-bags if piles are strangulated, or an antiseptic solution if only burning and smarting are present. Compound liquorice powder and copious enema for cleansing the bowel preparatory to operation, and a small enema just before. Shaving of the perineum and thorough cleansing with soap and water; followed by ether and solution of the perchloride, after anæsthesia and dilatation of the sphincter. A good-sized sponge with a string attached, is wrung out of

perchloride solution and introduced high into the rectum; any internal hæmorrhoids are made to protrude by making traction on the sponge.

The technique of the operation may be thus summarised:—

1. Apply the clamp in the long axis of the hæmorrhoid, so that the scar may be a radiating one, and thus avoid any chance of cicatricial stenosis.

2. Dip the distal end of the clamp well down, so as to include the mucous membrane of the hæmorrhoid in its entire length, though only clamping off about one-third of its substance. Be sure that no skin is included, otherwise the subsequent œdema will be very great and the time of recovery lengthened.

3. Sear the hæmorrhoid slowly from above downward, layer by layer, the cautery being only at a dull red heat. By observing these precautions, subsequent hæmorrhage may be avoided.

4. Insert a tampon cannula, which should remain until the bowels are opened. This cannula is made from a piece of half-inch rubber tubing, sterilised, and having around it several layers of iodoform gauze. It is then anointed with sterilised vaseline, and inserted into the rectum after the operation. It allows the escape of secretions and flatus, and the first enemata may be given through it without causing much pain.

Opiates are given to relieve the pain after the anæsthesia wears off. On the morning of the third day half an ounce of sulphate of magnesium is given and followed two hours afterwards by an oil enema through the tampon cannula. The magnesia is repeated on each successive morning, and by the eighth day the patient is ready to leave. No dressing is used save a piece of iodoform gauze and a T-bandage.

Several advantages are claimed for the clamp and cautery method. It is antiseptic; not only can the clamp be readily sterilised but the cautery itself is the most powerful germicide. There are no sloughs to separate, as in the ligature operation. No ligatures or sutures offer any chance for infection. The operation is rapidly performed, and the cure is complete. Eight days suffice for convalescence. The record of hæmorrhage, pyæmia, or death is almost negative. Among the 500 cases referred to there has not been a single death. There were a few slight hæmorrhages, and one case of pyæmia, from which the patient recovered. Whitehead's method, formerly in vogue to a much greater extent, is now reserved for those cases in which the mucous membrane is involved too high up to be reached by the clamp, and for others in which previous operations have left a raw, ulcerated surface.

2. Atony of the rectum.

W. Bodenhamer, of New Rochelle, N.Y. (*N.Y. Med. Journ.*, June 19, 1897, p. 831) condemns the practice of using warm or hot water injections for the purpose of securing a daily evacuation. If it be necessary to use enemata for this purpose, cold water should be employed with the view to increase the tonicity of the muscular fibres of the rectum. But even cold water injections, used daily for a lengthened period, may cause atony by unduly dilating the lower bowel. They are, however, very useful when properly employed; but should be discontinued as soon as the object of their use has been attained. In specially obstinate cases powerful astringents should be employed as rectal injections, with nux vomica internally, either alone or combined with other drugs. The injections should not exceed in measure 5 or 6 ounces, and before their administration the rectum should be emptied of fæcal contents by a simple enema or an aperient. The astringent injection is to be used once daily, and retained for a few minutes, if possible. Bodenhamer uses decoction of galls, and also a strong decoction of white oak bark with alum. Internally, Extract. Aloes, gr. xxx.; Extract. Nuc. Vom., gr. xx.: Extract. Hyoscyam., gr. xv.; Ferri Sulph., gr. x.; Ol. Caryophylli, gutt. v. Fiat massa in pil. xxx. dividenda. For atony of the anal sphincters, the cold ascending douche is the most valuable remedy. It should be applied to the anus for four or five minutes immediately after each action of the bowels, and once or twice besides during the twenty-four hours. Galvanism should also be employed, and nux vomica given internally.

3. The treatment of pruritus ani.

R. Abrahams, Physician to the Mount Sinai Hospital, New York, states (*Journ. of the American Med. Association.*, Jan. 30, 1897, p. 212) that in the treatment of this distressing ailment there is nothing better or more effective than the vigorous application of a strong solution of nitrate of silver. The cause should always be sought for and, if possible, removed; but if the pruritus still continue, the application will seldom fail to afford relief. The strength of the solution should be from 30 to 50 per cent., according to the severity of the itching. In apparently idiopathic cases the nitrate of silver proves to be a veritable specific. Even if there be a palpable cause, the application will ensure rest at night and ease by day while the cause is being removed. It should be applied once or twice a week, zinc ointment, either plain or mixed with 1 per cent. of cocaine, being used in the intervals. Before painting the anal region with the

solution, it is generally well to apply cocaine, in order to mitigate the burning sensation.

A weaker solution than that recommended above often acts satisfactorily, and spirit of nitrous ether is a good solvent; gr. x–xx. to ℥j. may be painted over the part with a camel-hair brush.

The application of a 2 per cent. solution of nitrate of silver is recommended by **Schmey** for hæmorrhoids and anal fissures (New York *Med. Record*, June 5, 1897, p. 828). Daily brushing with this solution is said to obviate the necessity for an operation. In a case of coccygodynia, refractory to other treatment, the solution was applied with great success to piles, from which the patient suffered; after eight applications the coccygodynia had also disappeared. In a case of fissure of the anus, accompanying hæmorrhoids and preventing sleep by reason of pain, the same solution effected a cure.

Nitrate of silver thus applied would doubtless cure slight cutaneous excoriations and cracks; but for true anal fissures caustic applications are useless and mischievous.

The application of collodion to pruritus ani and piles has been found useful by **D. W. Samways** (*Brit. Med. Journ.*, vol. ii., 1896, p. 1502). He states that after a few moments of somewhat intense smarting (which can be prevented by cocaine if necessary) no further itching is felt ordinarily for twelve or twenty-four hours, if at all. It may be supposed that the ether and alcohol in which the pyroxylin is dissolved stop the irritation, and the collodion film, by protecting from the air, prevents its recurrence. When applied to external piles, he has observed that collodion stimulates contraction of the swelling; that the hardening film supports the pile thus contracted, and that the contracting collodion further reduces it. The collodion is best applied by dropping it on a few fibres of cotton wool, which are spread over the pile each morning after defæcation.

Among other papers on the treatment of Diseases of the Rectum, recently published but not coming under the ordinary scope of the "Year-Book," may be mentioned: **Kraske**, "Erfahrungen über den Mastdarmkrebs," being Nr. 183/84 of the *Sammlung klin. Vortr.*, 1897; an article by **E. H. Taylor**, of Dublin, *Annals of Surgery*, April, 1897, p. 385, on the "Operative Treatment of Cancer of the Rectum"; papers by **Swinford Edwards** on "Removal of high-lying Cancer of the Rectum by Kraske's Method," *Brit. Med. Journ.*, vol. i., 1897, p. 1210; by **F. T. Paul**, on "Excision of the Rectum," *Brit. Med. Journ.*, vol. i., 1897, p. 856; and by **H. Littlewood**, "The Operative Treatment of Malignant Disease of the Rectum," *Lancet* vol. ii. 1896, p. 745.

VENEREAL DISEASES.

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I. The treatment of syphilis.

At the Thirteenth International Congress of Medicine (*Ann. de Derm. et de Syph.*, Aug.-Sept, 1897) held at Moscow in August, 1897, a discussion took place on the treatment of syphilis, and attempts were made to solve the following questions: When should the mercurial treatment of syphilis be commenced? For how long should the treatment be continued? Should one treat the disease only during the presence of symptoms, or should one have recourse to continuous treatment, with a view to preventing its subsequent manifestations?

Schwimmer, of Buda-Pesth, advocated prolonged anti-syphilitic treatment in sufficient doses, and commenced directly the diagnosis of syphilis was made.

Watrazewski, of Warsaw, was opposed to the preventive treatment on account of the possible supervention of mercurial anæmia, chronic mercurialism, and the too energetic action of the drug when introduced into subjects as yet unaccustomed to its action.

Jullien, of Paris, said that the general consensus of opinion as expressed at every congress held within the past thirty years inclined to early and energetic treatment; to combat a general blood disease it was necessary to apply the specific treatment at the earliest possible date. His experience, based upon a systematic application of the method for some time past, led him to believe that injections of calomel formed the most efficient antidote to the disease. The cutaneous manifestations were suppressed by this treatment in a large majority of cases, or were so completely modified that were it not for the presence of the glandular enlargements the diagnosis might be open to doubt. He was unable to lay down precisely the length of time required for the treatment; he considered that it should, at any rate, last for a year, and in many cases he had continued it for two years or

more; at the present time he was unable to say if patients so treated were liable to subsequent tertiary manifestations; he could, however, state that he had not yet met with any such cases.

Barthélemy, of Paris, laid stress upon the two following points: to give mercury as soon as the diagnosis of syphilis was certain; to abstain from all anti-syphilitic treatment if there was any doubt as to the nature of the disease. It was necessary to treat the syphilides, and not the syphilis, to combat the diathesis from the earliest possible date; the most energetic method of treatment was by injections of the insoluble salts of mercury once a week; a course which was to be continued for eight months in the first year of infection, for six months during the second, for three months during the third; then should follow a year without treatment, and then for two months during each of the three following years the treatment should be resumed.

Caspary, of Königsberg, said that the treatment of syphilis ought to be commenced on the appearance of unmistakable manifestations on the skin or mucous membranes. The induration of the chancre and the indolent enlargement of the neighbouring lymphatic glands were probable, but were not certain indications of syphilis. Treatment should, during the first course, be energetic and should be continued for some weeks after the disappearance of all symptoms; inunctions and injections were preferable to internal treatment, but should be interrupted directly the patient's general health showed signs of enfeeblement. The succeeding courses will be more efficacious if given immediately on the appearance of any subsequent manifestation.

Rosolimos, of Athens, stated that in all the cases of tertiary syphilis he had met with he had found that the previous anti-syphilitic treatment had been inadequate, or even *nil*. He advocated the continuance of treatment, with intermissions, for four or five years, even in the absence of all syphilitic manifestations.

A discussion on the same subject took place at the meeting of the British Medical Association at Montreal (*Journ. of Cut. and Gen. Ur. Dis.*, Oct., 1897).

Whitla, in opening the debate, laid stress on the following points:—(1) The action of mercury and of the iodides on the disease; (2) The time when mercurial treatment should be commenced; (3) What method of administration should be adopted? (4) The treatment of tertiary and congenital syphilis. He recommended that mercurial treatment should be commenced as soon as the diagnosis was made, and considered that inunction was the

most useful method of administration. He began his treatment by a course of Plummer's pills, and continued with Pulv. Hyd. c. Cret. in grain doses six or seven times daily. He pushed the iodides in the tertiary stage, and prescribed them also in cases of pyrexia occurring early in the secondary stage.

Nevins Hyde had no opinion of the iodides, but considered that the constitution of the patient was a most important factor as regards the success or failure of treatment.

Malcolm Morris laid stress on the antagonism between alcohol and syphilis; he commenced mercurial treatment at once, and preferred inunction to other methods.

C. W. Allen emphasised the point that it was the individual who had to be treated more than the disease. While inunction was in the majority of cases to be preferred, yet the injection of the soluble salts gave excellent results. He advocated immediate treatment, in opposition to the majority of his brethren in the United States, who preferred to wait until the diagnosis was confirmed by the appearance of secondary symptoms.

Bulkley believed that iodides removed the lesions, whilst mercury attacked the vital element upon which the lesion depended for its existence. **Whitla**, in conclusion, confessed that he often eased off the continuous treatment, to permit evidences of the disease to appear, and to convince him that there had been no mistake in diagnosis.

The general consensus of opinion was that mercury in some form should be given directly the diagnosis was made, but little stress was laid on the fact that in many cases the diagnosis was uncertain, and could only be determined by the appearance of the eruption. **Caspary** pointed out that induration of a sore accompanied by enlargement of the inguinal glands was not of necessity an indication of syphilis. **Jullien** in some of his cases appears to have been in some doubt, and depended for a diagnosis upon the glandular enlargements, and Whitla states that in some cases he has had to relax the mercurial *régime*, so as to allow some further manifestation of the disease to develop, and so to establish his diagnosis.

2. Intravenous injections of mercurial salts in syphilis.

At a meeting of the Soc. Franç. de Derm. et de Syph., held in April, 1897 (*Ann. de Derm. et de Syph.*, May, 1897), **Abadie** stated that since his last communication on this subject (*vide* "Year-Book of Treatment," 1896, p. 277) he had seldom employed any other mode of treatment. Among the principal advantages of these injections was the absence of pain and of subcutaneous

nodosities. After the use of intramuscular injections of insoluble salts, such as calomel, and even with the soluble preparations, there was always considerable pain and subcutaneous thickening resulting therefrom.

If ordinary antiseptic precautions were used, there was absolutely no danger from intravenous injections; the only serious objection to them was the difficulty in some instances of finding the veins, a difficulty which could usually be overcome by care and practice. Even if the vein was missed, the only result was a subcutaneous thickening which was absorbed in a few days. He introduced the injections every other day, using a Pravaz syringe full of a 1 per cent. solution of cyanide of mercury on each occasion. In certain grave ocular manifestations, such as parenchymatous keratitis and malignant irido-choroiditis, this dosage was not sufficient, and the injections should then be given daily; this quantity was well borne, and was followed by no symptoms of mercurial intoxication. In the treatment of lesions of delicate organs, such as the eye and nervous system, not only was it necessary to effect a cure of the patient, but to bring about that result as speedily as possible. He brought forward two cases of syphilitic irido-choroiditis in patients over sixty years of age: in the one case the veins were so ill developed that intravenous injections could not be carried out, and consequently recourse was had to intramuscular injections of calomel; these, however, were not well tolerated, and he could not prevent destruction of the retina and loss of vision; in the second case, which was an exactly parallel one, intravenous injections were given daily, the result being complete recovery with perfect vision.

The writer of this article has adopted this form of treatment as a routine in hospital cases with the most satisfactory results.

3. The treatment of syphilitic chancre in its complications.

In a lecture on this subject delivered at the Hospital St. Louis (*La Presse Médicale*, July 7, 1897) **Professor Fournier** commenced by discussing the merits of the abortive plan of treatment, and condemned it except in a small minority of cases, in which the chancre was situated either on a too lengthy prepuce, or on an exuberant labium minus; in such cases the patient could be relieved of the chancre and of the deformity at the same time. It might be laid down that the excision of a well-developed chancre was a perfectly futile measure, whilst it was very doubtful whether the excision of a chancre of four days' duration would in any way modify the subsequent course of the disease; in the

majority of cases the abortive treatment had failed; indeed, in the Paris hospitals it had never yet succeeded.

The syphilitic chancre was a lesion which tended to heal spontaneously; nevertheless, one should endeavour to further the healing process by hygienic measures, and by certain necessary precautions. In the first place, it was necessary to prescribe continence, for to a large number of patients—specially female ones—the lesion appeared to be so trivial as to preclude the possibility of contagion therefrom; secondly, to forbid all forms of stimulants which might injuriously react upon the chancre, and, finally, to recommend abstention from violent exercise and fatigue. Locally, the application of tepid water was recommended, either by means of general baths, or by ablutions of the chancre itself. Ointments were preferable to lotions, as they could be easily changed, and had no tendency to adhere to the sore; calomel, oxide of zinc, and subnitrate of bismuth being specially indicated. Any irritant, such as alum or sulphate of copper, was to be avoided, while the employment of iodoform was absolutely useless, and to most patients insupportable on account of its smell. Nitrate of silver was rarely indicated, but might be utilised if the appearance of the chancre remained persistently unhealthy, or if during the later stages of cicatrisation the granulations were exuberant. In many instances the induration left after the healing of the chancre was a source of anxiety to the patient owing to the deformity resulting therefrom, and the surgeon was frequently importuned for treatment to remove this. As this thickening tended to disappear spontaneously, no surgical interference was justifiable, and any attempt at removal or scarification would be followed by further induration of the cicatrix. Their resolution might be hastened by mercury and iodide of potassium in conjunction, and locally by frequent ablution and application of non-irritant ointments. In addition to the general principles of treatment, Fournier alluded to the special treatment required for chancres situated in unusual localities. Chancres of the meatus and of the urethra were difficult to treat owing to their inaccessibility, and owing to their being so frequently irritated by the passage of urine over them, which frequently gave rise to sloughing, and even to phagedæna: scrupulous cleanliness and bathing after each act of micturition, dressing with cotton wool, and the avoidance of all sources of irritation, were the means specially recommended. These lesions might be followed by stricture of the meatus, which might be overcome by dilatation, or might possibly require incision. Chancres of the cervix uteri required but little treatment, but their cicatrisation might be

hastened by mild antiseptic injections, and by applications of nitrate of silver or tincture of iodine.

The principal complications of the syphilitic chancre, inflammation, gangrene, and phagedæna, were closely allied to one another and should be treated on the same lines, mainly by scrupulous cleanliness, and by the removal of any cause for irritation. Should phimosis ensue, careful subpreputial injections should be practised, and should balano-posthitis supervene, with retention of its secretion beneath the prepuce and with threatening gangrene, free longitudinal incision of the prepuce was called for, while cases of paraphimosis, in which the chancre appeared to be affected by the constriction, should also be freely incised.

Should the case go on to gangrene or phagedæna, the most powerful remedial agent consisted in baths lasting for three hours at a temperature of 95° F., and repeated daily. The most efficient local application in these conditions was iodoform powdered freely over the affected surface.

4. The treatment of syphilis by intramuscular injections of salicylate of mercury.

Hallopeau and **Bureau** (*Journ. des Mal. Cut. et Syph.*, April, 1897) employ as an injection 4 parts of salicylate of mercury to 30 parts of oil of vaseline, the dosage used being $\frac{1}{2}$ cub. centimetre introduced into the buttock twice weekly.

Their conclusions were as follows :—

1. Intramuscular injection of salicylate of mercury suspended in oil of vaseline was one of the best methods of administering mercury.

2. The pain caused by the injections was well tolerated by a large majority of patients.

3. They never caused salivation.

4. They very rarely produced suppuration (12 times in 176,000 injections practised by Tarnowski).

5. In contrast to injections of grey oil, if by any chance they entered the circulation, the symptoms of pulmonary embolism rapidly disappeared and were of no gravity.

6. They were remarkably active.

7. They could enter into the routine treatment of syphilis.

8. They were not contra-indicated in cases of syphilitic albuminuria; in fact, they often produced a rapid cure of this condition.

9. It was improbable, as had been stated, that relapses were more frequent after this method of treatment, for the conditions of the human organism were favourable to the absorption of the salicylate.

5. Serumtherapy in syphilis.

Tarnowski (*Archiv f. Derm. u. Syph.*, 1896, p. 63) enumerated the different methods of serumtherapy which had been employed in the treatment of syphilis.

1. Injections of the serum of healthy animals, dogs, lambs, or calves.

2. Injections of human serum from patients in the secondary and gummatous periods, and from children the subjects of hereditary syphilis.

3. Injections of the serum of animals previously inoculated with syphilis.

So far serumtherapy had given no curative results in syphilis, but the success produced by this treatment in diphtheria and erysipelas gave hopes that a similar result might be obtained in syphilis, and stimulated the observer to further research. But as the bacillus of syphilis could not be cultivated, nor its toxin artificially prepared, one was compelled to work in the dark in this direction, and to argue exclusively by analogy.

Repeated inoculations on a horse with the secretion of primary sores and mucous tubercles, and the introduction under the skin of fragments of mucous patches and of the primary syphilitic induration, did not produce any analogous symptoms in the animal experimented upon. But at the autopsy the microscope revealed in the lymphatic glands, in the liver, in the heart, and in the aorta, lesions which corresponded exactly with those of syphilis in the condylomatous stage. Horses, therefore, were not refractory to the contagion of syphilis, and by the employment of their serum perfect analogy with anti-diphtheria serum could be obtained. On one horse fifty-seven inoculations were made in the space of seven months, the only noticeable reaction being in the appearance of several nodules on each side of the vertebral column of about the size of a hazel nut.

The serum was then carefully taken from the horse, and was employed on six syphilitic subjects with the following results:—

The serum did not arrest gangrene of a primary syphilitic induration, nor the later development of the sclerosis, nor was the second period of incubation materially prolonged by the treatment. The secondary eruption appeared in the ordinary course, the eruptive fever was not modified, and the development of a maculo-papular syphilide with polyadenitis followed the same course as in any case not submitted to treatment. In the gummatous period this treatment was powerless against nocturnal *osteocopic* pains, and did not prevent the appearance of gummata;

nor did it improve the general condition of the patients, and loss of weight, albuminuria, purpura, and pyrexia were noted.

The efficacy of antitoxin did not depend upon the destruction or the neutralisation of the toxins, but on the intensification of the resisting power of the individual. It was clear also that mercurial treatment did not directly react upon the toxin, but endowed the blood with a certain power of resistance against the syphilitic contagion.

It was possible that the serum of animals having a certain receptivity for syphilis, if introduced as a vehicle for the administration of anti-syphilitic remedies, might produce favourable results, not only by reason of the mercury introduced, but by augmenting the immunity of the blood.

With this view he proceeded to mercurialise healthy horses by repeated intramuscular injections of calomel, and proposed injecting patients with serum taken from the mercurialised animals.

The result of these experiments was not yet forthcoming, but would shortly be published.

6. A case of syphilis gravis cured by the Aachen specific method combined with surgical treatment.

Brandis and **Thissen** (*Brit. Med. Journ.*, Aug. 7, 1897) give the history of a case described as above, the salient features of which were as follows :—

The patient, a healthy subject, with the exception of a tendency to malarial attacks, aged 62, contracted a sore in Jan., 1895 ; this was followed by severe influenza and septic bronchitis. In August a smooth rounded swelling appeared on the right side of the thyroid cartilage, and almost occluded the glottis ; this improved under anti-syphilitic treatment. In September he had periosteal nodes on the shins and forearm, and the laryngeal swelling again appeared. Tracheotomy was performed, and some necrosed pieces of cartilage were removed ; there was subsequently suppuration over the left tibia. The patient had been for eight months treated with mercury and iodides, and was in June, 1896, sent to Aachen and underwent the customary routine of the place for two months, during which time a large piece of necrotic ossified cartilage was removed through the tracheal wound, and finally the patient was pronounced cured in May, 1897. In their comments on the unusual course of the malady, the authors attributed this either to the advanced age of the patient, or to a mixed infection of syphilis and influenza in a system where malarial fever had left its traces, and they attributed his so-called cure to two months' inunction treatment in combination with the

use of the Aachen waters, which combination they said was one of the strongest antidotes, if not the most powerful, to the syphilitic poison.

Commenting on this case, **Arthur Cooper** (*Brit. Med. Journ.*, Sept. 11, 1897) expressed doubts as to whether the waters of Aachen had any specific influence over syphilis, amd did not believe that the effect of mercurial treatment in that resort produced any more favourable results than similar treatment in England, provided that the patient was obedient to his instructions, and paid due attention to details as regarded his treatment and his mode of living generally, nor was there any evidence that cases treated at Aachen were any less liable to relapses than those treated elsewhere.

7. The abortive treatment of gonorrhœa.

In a discussion on this subject (*Ann. Mal. des Org. Gén.-Urin.*, 1896, p. 1013) **Janet** held that before the discovery of the gonococcus it was very easy to confound cases of simple urethritis with true gonorrhœa, and it was only in the former class that the abortive treatment was successful; it was doubtful if a true gonorrhœa was ever aborted in those days.

During the incubation period the gonococcus was, in Janet's opinion, penetrating into the epithelium and even into the subepithelial layer, and the treatment of this stage was nearly similar to that which should be employed later; it was not, strictly speaking, abortive, for such treatment could only be carried out immediately after infection, or before the gonococcus could be recognised.

In all cases in which Janet had applied his treatment (described in "Year-book of Treatment," 1896, p. 283) before the onset of acute symptoms, he had effected the complete suppression of the gonorrhœal process and all its complications, and at no period was there any sign of increase in the number of the gonococci. In from eight to twelve days a cure was effected if the patient was sober and regular in attendance, and gave the requisite amount of time, provided that an extra-urethral focus of infection in the neighbourhood of the meatus had not been overlooked.

Such a result could be obtained only in a limited number of cases, and the treatment was not applicable to hospital patients; and consequently Janet expressed a wish that the method known by his name might not entirely supersede the old-fashioned plans of large doses of balsams, of nitrate of silver and corrosive sublimate injections, etc., in which he conceded there might be some merit.

De Vigneron, of Marseilles, had employed Janet's treatment for five years, and had met with twelve cases in which the patients presented themselves thirty-six hours after infection; in these twelve cases, he had in nine instances been able to obtain absolute dryness of the urethra in from six to ten days, and he had continued the irrigations for two days after the disappearance of the gonococci. In one case, in which the treatment was stopped immediately on the disappearance of the gonococci, there was a recrudescence within forty-eight hours, which required eight days' further treatment.

In cases of longer duration, he had brought about the disappearance of the gonococcus in from fifteen to thirty days, but in these cases there often remained a drop of mucous or muco-purulent secretion which necessitated further treatment.

Guiard, though convinced of the value of the treatment, differed as to its technique. Finding that violent reaction and excessive pain frequently supervened, he had reduced the strength of the permanganate solution to 1 ad 1000, and had been surprised to find that the gonococci disappeared more quickly than with the solution as used by Janet, that the patients only experienced very trifling discomfort, and finally that there was no reactionary secretion. He further advocated the use of the syringe instead of the irrigation method, on the ground that it was more convenient for the surgeon and safer for the patient, for by it the least sensation of resistance was conveyed to the hand of the operator, who could regulate the amount of pressure necessary. The irrigations were not applicable to all stages of the disease; they were very valuable at the outset, but were harmful after the fourth day, though again in the later stages of the disease they resumed their former efficacy.

Noguès, of Paris, considered the treatment to be applicable only in the very early stages of the disease, and he had met with but small success when employing it during the acute stage; he used the irrigator, with a solution of 1 ad 4000 to 1 ad 500, the latter strength being justifiable only for the anterior urethra. He deprecated the persistent use of one drug, and in the event of the permanganate of potash irrigations failing to cure, he would change to a solution of nitrate of silver or oxycyanide of mercury.

Evand, of Lyon, maintained that Janet's method, whilst modifying the period of suppuration and altering the nature of the discharge, did not merit the name of abortive treatment, for it lengthened the period of decline of symptoms, and consequently had no marked advantage over the older modes of treatment. Other substances, such as methyl blue, gentian violet, and other

aniline colours, had a more marked antagonism to the gonococcus than the permanganate salt.

Desnos, of Paris, limited the treatment to the anterior urethra, preferred the syringe to the irrigator, and allowed the solution to escape at once. He commenced with a strength of 1 ad 500, on the second day reduced it to 1 ad 1000, and for the next three days to 1 ad 5000.

8. The treatment of gonorrhœa by injections of argonin.

Christian (*Therap. Gaz.*, July 15, 1897) gives the results of his treatment of ninety cases of gonorrhœa by injections of argonin, which, though not so brilliant as those obtained by Jadassohn ("Year-Book of Treatment," 1897, p. 278), were on the whole satisfactory. He arrives at the following conclusions :—

1. Argonin is absolutely unirritating, and can be used in solutions from 1 to 10 per cent.

2. In the great majority of cases it lessens the discharge very rapidly.

3. Its use is generally followed in a short period by a disappearance of the gonococci.

4. This disappearance of the gonococcus is not in all cases permanent; in other words, there is in a large proportion of cases a distinct tendency to relapse, with reappearance of gonococci.

5. It possesses distinct value as a hand injection (as distinguished from irrigation) in the stationary period of the disease, but is of very little benefit in the mucous stage, or stage of decline.

6. It produced no results in the treatment of chronic anterior urethritis.

9. The duration of acute gonorrhœa under treatment.

Christian (*Therap. Gaz.*, January 15, 1897) concludes his communication on this subject with the following very apposite remarks :—

1. Gonorrhœa is a much more prolonged and serious affection than it is usually considered to be by general practitioners of medicine and by the laity.

2. In two-thirds of all cases uncomplicated, the period of time necessary to obtain a complete cure is from six to ten weeks.

3. In that small proportion of cases where the entire urethra does not become involved, the disease being confined entirely to the anterior urethra, we can, as a rule, expect complete recovery in about four weeks.

4. The necessity of impressing upon the profession in general the importance of making examinations of the urine before deciding that an attack of gonorrhœa is positively cured.

RECENT PUBLICATIONS.

"Genito-Urinary Surgery and Venereal Diseases." **J. William White, M.D.,** and **Edward Martin, M.D.** (Philadelphia: J. B. Lippincott & Co. 1897.)

"A Manual of Venereal Diseases." **J. R. Hayden, M.D.** (Lea Bros. & Co. 1890.)

"A Pictorial Atlas of Skin Diseases and Syphilitic Affections." In Photo-lithochromes from Models in the Museum of the Saint Louis Hospital, Paris, with explanatory woodcuts and text. By **Ernest Besnier, A. Fournier, Tenneson, Hallopeau, Du Castel,** with the co-operation of **Henri Feulard** and **Leon Jacquet**. Edited and annotated by **J. J. Pringle, M.B., F.R.C.P.** (London: F. J. Rebman. Parts I.—VIII. Price 10s. 6d. each part.)

"Der Syphilis Bacillus." **Van Niessen.** (Wiesbaden, 1896.)

THE DISEASES OF WOMEN.

By G. Ernest Herman, M.B. Lond., F.R.C.P.,

Senior Obstetric Physician to the London Hospital, etc. etc.

The first subject that I notice is one which deals with the fundamental pathology of the pelvic organs. It is therefore important to the practitioner, although he may be obliged to take upon trust what is stated. In bacteriology things become out of date in a year or two. But the important work I quote from is based upon most laborious researches, and embodies our knowledge up to date.

1. The bacteriology of the female genitals.

When the part played by microbes in the production of disease was first found out the word "germs" implied something maleficent, external, and foreign to the healthy organisms. We are now getting to learn something of the enormous variety of the microflora, and to recognise that there are microbes which do not cause disease, and may even perhaps prevent it. Some surgeons have taken immense pains to sterilise, as they thought, the vagina and cervix uteri, and have blamed what they called the septic cervical canal for bad results which followed the amputation of the body of the uterus. Obstetricians have talked about "autogenetic" puerperal fever, or "self-infection," meaning by it that the lying-in woman was poisoned by germs already within her vagina before she was delivered. All this is mere guesswork until we know exactly what bacteria exist in the female genital passage and what they do.

Menge and **Krönig** ("Bacteriologie des weiblichen Genitalkanales." Leipzig : A. Georgi, 1897) have published a large book giving the results of their investigation of the micro-organisms found in the female genital canal in health and in disease. I do not think that they have completed our knowledge of the subject, but their results are the latest and therefore worth quoting. They begin with the *vulva*. The bacterial flora of the *normal* vulva is a very variable one. The mass of the bacteria which lie in the vestibule are anaërobic saprophytes which descend from the vagina. Among them there are also found infective bacteria—

the staphylococcus pyogenes aureus, the streptococcus pyogenes, the bacterium coli commune, the gonococcus of Neisser, and the bacillus tuberculosis. These infectious bacteria come from the internal genitals, from the vulvo-vaginal glands, from the urinary passage, and from sources external to the patient. In *disease* of the vulva, infective bacteria—the staphylococcus pyogenes aureus, the streptococcus pyogenes, and the bacillus tuberculosis—may get from the tissues into the secretions. It is improbable that a specific gonorrhœal vulvitis exists either in adults or children. Gonococci found in the secretions of the vulva have generally come from the vagina; and when along with gonorrhœal vaginitis there is vulvitis, the latter can be easily cured although the vaginitis remains the same.

It is as yet undecided whether pathogenic micro-organisms, or germs at all, exist in the normal *urethra*. Suppurative inflammation of the female urethra is almost invariably the work of Neisser's gonococcus. There are rare forms of purulent urethritis produced not by gonorrhœal infection but by infection with other germs—*e.g.* the bacterium coli commune and pyogenic staphylococci.

The healthy *Bartholin's gland* and its duct probably contain no bacteria. Inflammation of the gland is in most cases a gonorrhœal disease. Gonococci can produce a large abscess of Bartholin's gland without the help of any other organism. The pus of such abscesses is often free from germs, but often it contains gonococci; more seldom the staphylococcus pyogenes aureus or anaërobic saprophytes.

We now ascend to the *vagina*. The microflora of the healthy vagina is different at different periods of life. In the newly born infant the secretions in the vagina are sterile and faintly acid. Soon after birth bacteria wander in, which make the secretions more strongly acid. Among them is the bacillus vaginalis of Döderlein. The bacterial flora of the vagina of the adult virgin is like that of the child. When sexual relations are commenced the biology of the vaginal secretions alters. Its flora becomes manifold; it may become faintly or strongly acid, neutral, or alkaline. During pregnancy the bacterial contents of the vagina come to resemble those of the child. The vaginal secretions of the woman at the climacteric are more often alkaline in reaction, and present a very diversified microflora. The micro-organisms which are found throughout life in the normal vaginal secretions, in the forms of cocci, rods, and spirillæ, are mostly anaërobic. The reaction of the vaginal secretions depends partly upon the admixture of secretions from the uterus, partly upon the quantity

of the vaginal secretion, and partly upon external influences. The vaginal secretions throughout life are antagonistic to the life of micro-organisms, and this effect is most marked during pregnancy and in children and virgins. The bacteria found in the vagina are mostly those which grow upon alkaline culture media, and therefore the bactericidal power of the vaginal secretions is due to their acid reactions, aided by leucocytes and fluid transuding from the tissues. This self-cleansing power of the vaginal secretion can be artificially destroyed when the secretion has been removed from the vagina, and can be artificially weakened while it is still in the vagina. Even under natural conditions it may become weakened or lost, so that the vaginal secretion becomes then a fit soil for the growth of anaërobic saprophytes capable of infecting the body. It is very improbable that this ever happens *intra partum*. In non-pregnant sexually mature women spontaneous infection and intoxication of the organism from the internal genitals are conceivable. Infective bacteria may be found in the vaginal secretions which are being eliminated by the vagina from diseased internal parts.

From the bacteriological point of view the genital canal may be divided into (1) the *pars copulationis*, consisting of the vagina and the vulva, the vagina being generally aseptic, the vulva not. Both parts contain saprophytes under normal conditions. (2) The *pars gestationis* is sharply divided from the part below it by the os uteri externum, and is usually free from germs. The reaction of the vaginal secretion influences the bacterial condition of parts above, for it contains only those bacteria which thrive in an acid medium, while the secretion of the uterus is alkaline. The vagina of a pregnant woman who has been for long untouched is always aseptic. Before operations the vagina of a non-pregnant woman should be, if possible, sterilised.

In the foregoing paragraphs I have summarised the author's investigations into the bacteria which inhabit the *healthy* vagina. I now briefly review their investigations into the effects of pathogenic microbes. They point out the great difficulty of drawing a definite line between health and disease. Their definition of a diseased vagina is one which presents signs of disease, and is accompanied by symptoms of disease. Among the diseases caused by bacteria they mention first *acute* and *chronic colpitis*. This may be caused by the staphylococcus pyogenes aureus. Its signs become marked about twenty hours after the introduction of the organism. It begins to subside about ninety hours after the entrance of the microbe, and by 120 hours after all signs of disease have disappeared.

Its signs are injection of the vagina and increased secretion. *Erysipelas*, *croup*, and *diphtheria* of the vagina may be set up by the micro-organisms which produce these diseases; but our authors have no new observations of these morbid conditions to bring forward. With regard to *gonorrhœa* in women, clinical observation and bacteriology seem at variance. The gonococcus seems to differ from many pathogenic bacteria in being able to find its way quickly into uninjured tissues, while most infectious bacteria require a solution of continuity for their admittance. It penetrates easily mucous membranes, the peritoneum, and connective tissue, but not skin nor subcutaneous fat. The authors accept metastatic suppurations as being due to the gonococcus, and not to mixed infections, as some think. They think that the pavement epithelium of the vagina is very like that of the skin. In children they believe a true gonorrhœal colpitis may occur. In adults the authors have never found the gonococcus the only or the preponderating organism in the vaginal secretion. They have found gonococci in the uterus when there were none in the vagina. In cases of granular vaginitis, they have examined excised pieces of mucous membrane and failed to find gonococci. The *à priori* improbability and the negative result of search for the gonococcus make the authors doubtful whether there is such a thing as a true gonorrhœal colpitis in the adult. [To my mind, the clinical fact that infection with gonorrhœa produces a purulent discharge from the vagina is too surely established to be set aside because some observers have in some cases failed to find the micro-organism believed to be the cause of the inflammation.] *Senile vaginitis* the authors believe not to be a bacterial disease but an outcome of senile involution of the parts. Lastly, "*colpitis emphysematosa*," otherwise called "*colpo-hyperplasia cystica*," and in English "vaginitis with gas-cysts," the authors hold is produced by a bacillus. It is almost superfluous to add that tuberculous disease of the vagina is due to a bacillus.

The next section of the genital canal is the *cervix*. Menge quotes the discrepant statements of former observers. His own observations lead to the conclusion that during pregnancy the cervical canal is free from germs, except in patients the subjects of gonorrhœa or tubercle. The cervix uteri in the non-pregnant female, whether normal, hyperplastic, atrophic, or the subject of the infiltration with small cells which indicates cervical endometritis, is also free from germs, excepting when gonorrhœal or tuberculous disease is present, or when dead tissue on which saprophytes can feed is present in the cervical canal. Other

germs may be present when the body of the uterus is the subject of disease, the bacteria having made their way down from the uterus into the cervix. Our author then asks the question, Why is the cervix generally sterile? One reason is that the only germs that can live in the vagina are those for which an acid medium is suitable; as the secretion in the cervical canal is alkaline, it does not suit them, and they do not wander in. But this is not the sole reason, for the cervical canal of the prolapsed uterus is free from germs; and there are obvious ways in which germs might be conveyed directly to the os uteri. The mechanical effect of the sudden narrowing of the genital canal at the os externum might be thought a reason, but, in view of the size of the organisms, can hardly be thought a sufficient explanation. Moreover, the gonococci do ascend. Another mechanical explanation is the downward current of the secretions from the uterus into the vagina, so that microbes have, so to speak, to swim against the stream. Menge believes, and relates observations in support of his view, that the real reason is that the cervical secretion has a bactericidal power. The cervix, when uninjured and undilated, may be likened to a filter, which lets the gonococcus of Neisser pass, but filters off all other germs. The tubercle bacillus does not usually reach the cervix by way of the vagina, but comes down from the body of the uterus. The presence of the gonococcus in the cervical secretion is not necessarily evidence of its having travelled upwards in the secretion, for this organism enters the tissues, and it may from the cervical tissue escape into the secretion filling the canal.

From the bacteriological investigation which I have summarised above, Menge draws the following important practical conclusions:—Disinfection of the cervical canal of a healthy pregnant or parturient woman is superfluous and, indeed, injurious. Disinfection of the cervical canal of a pregnant woman affected with gonorrhœa is impossible, because the organisms are in the tissues. Therefore attempts to disinfect the cervical canal before or during labour are to be condemned. The cervical canal of a non-pregnant woman, before or after amputation of the body of the uterus through the abdomen, should neither be mechanically cleansed, nor chemically disinfected, nor excised, nor burnt. No danger comes from the healthy cervical canal, and the proceedings referred to delay healing. Amputation of the uterine body, leaving the cervix, is better than the removal of the whole uterus, for if the latter operation be done, the peritoneum is placed in direct communication with the not always aseptic vagina, instead of being separated from it by the bactericidal cervix.

The next subject for investigation is the *uterine body*. Other observers have examined this part with the same object, and discrepant statements have been made. The following sentences express Menge's conclusion. Neither in the secretion nor in the mucous membrane of the normal body of the uterus do bacteria live which can be cultivated in the media commonly used. Neither in the secretion nor in the mucous membrane of uteri whose mucous membrane shows signs of so-called chronic endometritis, but not infiltration with small cells, do bacteria live which can be cultivated in the media commonly used. The external os uteri, both in pregnancy and in the non-gravida, is, under ordinary conditions, the boundary line between the section of the genital canal which contains microbes and the section which is free from them. Many cases of chronic endometritis, especially those in which the endometrium is infiltrated with small cells, are nevertheless of bacterial origin, most of them being produced by the gonococcus of Neisser. This organism usually diseases the whole uterus, both body and cervix. It invades the muscular tissue, suppuration of which, in rare cases, it may excite. In both acute and chronic gonorrhœa the gonococcus alone is found in the uterine cavity, no other microbes being present; so that the changes produced by the gonococcus do not help the entry of other micro-organisms. Some few cases of chronic endometritis are due to infective organisms, which may cause puerperal endometritis; but chronic endometritis in non-pregnant women is not due to such organisms. Tuberculosis of the body of the uterus generally has descended from the tubes. If the uterine cavity contains suitable food for bacteria, in the shape of retained secretions, dead pieces of new growth, retained secundines, or discharge from a wound of the uterus, bacterial growth may go on in it, if anaërobic saprophytes can get past the cervical canal. The bactericidal power of the cervix may be destroyed by secretions passing down it—as in cancer and senile endometritis—or by the enlargement of its canal by new growths or products of conception; and if so, the passage of bacteria from vagina to uterus will be allowed. The bactericidal power of the cervix is in like manner destroyed by its dilatation during labour; but it is then replaced by the increased bactericidal power of the vaginal secretion.

The next part of the genital track investigated is the *Fallopian tubes*. Menge's result can be briefly told. The healthy tubes are absolutely free from micro-organisms, unless the peritoneum contains the tubercle bacillus. Menge draws an important and,

I believe, real distinction between two different kinds of hydrosalpinx. One has a very thin wall, with a smooth serous covering, and containing clear, watery, colourless fluid. The folds of the tube are smoothed out; the muscular and connective wall thinned, the muscular bundles pressed apart. There is no infiltration with small cells, nor hyperplasia, nor hypertrophy of the muscular or connective tissue. In short, there are no appearances of either acute or chronic inflammation, but only changes due to mechanical distension. The second kind of hydrosalpinx has a thickened and stiffened wall, which on microscopical examination shows signs of chronic inflammation; there is small-celled infiltration, hyperplasia of connective tissue and muscle; the mucous membrane is thickened, folded, and often adjacent folds are adherent. Cases of the first kind form the majority. Menge has only seen two of the latter kind. In all there is closure of the abdominal ostium, which implies past peri-salpingitis; but adhesions are, as a rule, limited to the ostium. Such peri-salpingitis is presumably in some cases of bacterial origin; in others microbes have certainly nothing to do with it. Slight or even extensive adhesions may come from intra-peritoneal effusions of blood from which bacteria are absent. Such effusions of blood may come from ovulation or from tubal abortions. When laparotomy is performed on account of rupture of a tubal pregnancy, the tube opposite to the pregnant one is often found closed by adhesions about its ostium and filled with serous or sanguinolent fluid. With uterine fibroids hydrosalpinx, with adhesions closing the ostium, is often found when there is no reason to think that the inflammation has been caused by the invasion of bacteria. The same may be said of tubo-ovarian cysts. Menge considers that the gonococcus of Neisser plays no part in the production of hydrosalpinx; the inflammation it provokes is purulent. He does not believe that genuine hydrosalpinx is ever produced out of pyosalpinx. Long retained pus undergoes change, but is not converted into serous fluid. The only conditions under which hydrosalpinx can result from gonorrhœa is when the ostium is not occluded until the acute stage of salpingitis is over. If then the fimbriæ become sealed, hydrosalpinx may result; but it is a hydrosalpinx with a thickened wall. The streptococci and staphylococci which produce purulent inflammation do not, so far as we know, produce hydrosalpinx. Perhaps late in the course of such inflammation, when the virulence of the microbes has become weakened, it may extend to the tubes, and produce closure of their ends and serous exudation. These are only hypotheses; the fact

is that in most specimens of hydrosalpinx the tube shows no evidence whatever of inflammation. Streptococci may get to the peritoneum, not by way of the tubes but by way of the lymphatics from the uterus. Thus they may lead to closure of the tube and serous exudation into it, although the tube is anatomically unaltered, and microbes are not present within it. This explanation Menge thinks is not forced, and is in harmony with facts. No organism does so much harm to the female genitalia as the gonococcus, the maleficent effect of which Menge thinks is even yet under-estimated; but it has been unjustly blamed for hydrosalpinx. If Menge's views are correct, it follows that when the belly is opened and hydrosalpinx discovered, with thin walls and clear contents, the surgeon need not remove it; it will be enough to let out the fluid by reopening the end of the tube, and leave the tube.

The *bacteriology of pyosalpinx* is the next subject. Fallopian tubes *may* get inflamed without the influence of microbes, although, as their position protects them from mechanical, thermic, and chemical injury, this seldom happens. Salpingitis may possibly result from prematurely interrupted tubal pregnancy, which is now known to be far commoner than used to be thought; possibly also from pressure, or pulling, or disturbance of the circulation by ovarian or uterine tumours. Some think that a chronic hyperplastic endometritis may be set up by ovarian influence; and if so, salpingitis also may be caused in the same way. In animals inflammation can be set up by the injection of sterile fluids, such as oil of turpentine. We must, therefore, recognise the possibility of non-bacterial salpingitis; but we must also admit that we know nothing about its etiology, its development, its frequency, its course, or the importance of its effects upon the organism. Such causes probably produce thickening and infiltration of small cells without suppuration. Suppurative salpingitis is indisputably of bacterial origin; and Neisser's gonococcus is, without doubt, the most frequent cause of suppurative salpingitis. Bacteria may get to the tubes in different ways: (1) They may enter the tube from a diseased peritoneum; (2) they may reach it from an organ which contains bacteria and has become adherent to the tube; (3) they may get to the tube by way of the blood and lymph channels; (4) they may invade the tube from a diseased uterus.

(1) The tubercle bacilli are those which most frequently enter the tube from the peritoneum. Occasionally autopsies of patients dead from puerperal fever have shown suppurative peritonitis with less advanced and evidently secondary inflammation of the tubes.

Such inflammation is usually the work of the streptococcus pyogenes. Such salpingitis is for the gynecologist of theoretical interest only, as it is only found out in the dead body. Possibly such cocci of attenuated virulence may set up a localised abscess, from which inflammation may extend to the tube by its abdominal ostium. But invasion of the tube by these cocci is much less common than that by tubercle bacilli, because the latter do not till late excite inflammation, such as to close the fimbriated ends.

(2) The possibility of infective bacteria getting to the tube from the bowel cannot be denied. The bowel may be perforated so that microbes get into the peritoneum, and thence to the tubes. The necessary condition for this is that the inflammation caused by the peritonitis shall be local and not quickly close the tubes. If it be not local, the patient dies too soon for salpingitis; and if the tubes are quickly closed by adhesions, they are protected. Bacteria may also get from the bowel through the peritoneum into the mucous membrane of the tubes. Saprophytes from the bowel can only flourish in the tube if they find in it suitable nutriment, such as serous or sanguineous fluid; and this is only present when the fimbriated ends are closed. Saprophytes may get into the tube from the bowel either through a perforation or by traversing adherent surfaces. They may also get into it from the uterus.

(3) It is possible for bacteria to get into the tube from the blood. The tubercle bacillus is almost the only one that is thus conveyed to the tube. The presence of the pneumonia bacillus of Fränkel, which has been asserted, is very doubtful. The lymph channels are more often the road by which bacilli reach the tubes, travelling by this route from the mucous membrane of the uterus to that of the tubes.

(4) Lastly, bacteria get to the tubes from the uterus, travelling either in the mucous membrane or in the secretions. The commonest are the gonococcus of Neisser and the streptococcus pyogenes; more seldom the staphylococcus albus and aureus, the bacterium coli commune, and the bacillus tuberculosis. The gonococcus outweighs them all in importance. It may excite endometritis in a woman not pregnant, or a puerperal endometritis in a lying-in woman. The streptococcus pyogenes is practically unknown as a cause of salpingitis in a woman not pregnant. When it enters the uterus of a recently delivered woman it does not commonly spread superficially, because the endometrium is far less rich in lymphatic vessels than the muscular tissue; but it spreads along the lymphatics in the uterine wall to the peritoneum, and produces

peritonitis instead of salpingitis. The other bacteria which have been mentioned are only seldom found in the uterus. The tubercle bacillus hardly ever passes from the uterus to the tubes—its usual course is in the reverse direction. Hence tuberculous tubes are more common than tuberculosis of the uterus. Possibly the tubercle bacillus sometimes travels from the healthy uterus into the tube. Saprophytes are very rarely found in the uterus of a non-pregnant woman, but more commonly in the puerperal uterus. These may travel into the tube, but cannot flourish there unless they find a suitable food, such as retained serum or blood. Complete closure of the uterine end is not essential for the retention of serous or sanguinolent fluid.

In brief, the gonococcus is by far the commonest organism in the tube; next come the pyogenic streptococcus and the tubercle bacillus; yet more seldom the staphylococcus pyogenes and the bacterium coli commune; occasionally saprophytes.

Menge then discusses the meaning of the term "*mixed infection.*" He thinks this is used too loosely, and should be defined. He distinguishes three things to which it has been applied: First, two organisms—*e.g.* the gonococcus and the streptococcus—may simultaneously enter the uterus; say the gonococcus from the cervix, the streptococcus from an examining finger. They may both enter the tissues and flourish there. This Menge calls *infective*, *parasitic*, or *tissue symbiosis.* Secondly, two or more kinds of bacteria may live in the same secretion, which is fit food for both, without entering the tissues. This Menge terms *saprophytic* or *secretion symbiosis.* Thirdly, a tissue may have been infected by the gonococcus, and subsequently some other bacterium may enter the tissue. This Menge calls *secondary tissue symbiosis.* It is possible that sometimes one organism may prepare the way for another; thus the gonococcus may destroy the epithelium, and so enable one of the wound infective microbes to enter, or the discharge produced by gonorrhœa may prove a fit food for saprophytes. With gonorrhœa a further modification of mixed infection is possible. With tissue symbiosis of the gonococcus and the streptococcus, the latter may get into the blood or lymph channels, and so set up a metastatic infection elsewhere. The question is, Do these kinds of symbiosis really occur with gonorrhœa? Menge holds that the gonococcus of Neisser is not inclined towards symbiosis with other germs, for the secretions from surfaces inflamed by gonorrhœa contain, as a rule, either the gonococcus only or no germs at all. When the gonococcus is inoculated along with other microbes it soon destroys these and reigns alone. The gonococcus has never been

seen along with other organisms in the conjunctiva, the urethra, or the uterus. Cases have been observed in which the introduction of the erysipelas coccus or the streptococcus pyogenes has cured gonorrhœal inflammation. Menge concludes that long continued symbiosis of the gonococcus with other microbes does not occur in the tubes, except in the case of the tubercle bacillus. But a transitory symbiosis, lasting until the gonococcus has beaten the other organisms out of the field, may occur. These explain the occasional occurrence with gonorrhœa of metastatic abscesses, and are the only cases of gonorrhœa to which Menge would apply the term mixed infection. Other cases in which mixed infection with the gonococcus is alleged are not instances of true symbiosis—that is, of two organisms living and growing in the same tissue of fluid—but of admixture from accidental causes.

Menge points out that tubes containing pus are found in different conditions. Some have their ends open, communicating with the peritoneal cavity. In these inflammation is recent. They are swollen, red, their peritoneal surface is injected and connected by fresh, easily broken down adhesions to neighbouring parts. The mucous membrane is infiltrated with leucocytes, and its vessels dilated. The muscular coat may be infiltrated with small cells, but show neither hyperplasia nor hypertrophy. Others are closed at their fimbriated ends, and dilated into sacs, which show the effects of pressure within. They differ in size. Some are of the thickness of the little finger, with thin soft walls, and little infiltration or hyperplasia. Others have hard thick walls, with hypertrophy of muscular tissue and hyperplasia of connective tissue. Others, again, form large, thin-walled sacs, in which the mucous membrane is completely or almost completely destroyed, and by pressure from within the connective tissue and muscular coat are so thinned that the wall at places may be translucent. The two latter forms, as a rule, contain no gonococci.

Tuberculous disease of the tubes may be either primary or secondary. Menge calls attention to the great clinical importance of primary disease of the tube, in that it is not a very uncommon disease, and is one in which striking benefit follows removal of the diseased part. One of the patients under Menge's observation gained 10 lb. in weight, another 20 lb., and another 30 lb., within a short time after the operation. We understand not yet how the tubercle bacillus generally gets access to the tubes. The fact that it is commonest in women while the sexual organs are active, rarer in childhood and old age, points, in Menge's opinion, to the occasional communication

of the bacillus by sexual intercourse; and he relates one case in which the disease became manifest six weeks after the first intercourse with a man suffering from genital tuberculosis. On the other hand, as the disease does sometimes occur in virgins and in children, we are driven in them to accept the possibility of its getting to the tubes by the blood or lymph channels. The production of secondary tuberculous disease of the tubes is easy to explain, the bacilli entering from the peritoneal cavity.

The bacterium coli commune does not traverse the wall of healthy bowel, but inflammatory changes, which lead to adhesion between bowel and Fallopian tube, so alter the walls of both structures that they may become unable to resist the passage of this microbe.

Menge estimates that about 25 per cent. of cases of suppurative salpingitis are due to the gonococcus of Neisser, and about 10 per cent. are due to the tubercle bacillus. [Whitridge Williams* found 8 per cent. from this cause, so that he and Menge closely agree.] Other bacteria are far less common. In rare cases the gonococcus and the tubercle bacillus may exist together. Menge criticises the evidence of salpingitis caused by the pneumococcus of Fränkel, and shows that we have no certain knowledge as to the *rôle* played by this organism. The one case of Zemann shows that actinomycosis must be admitted as a possible cause of salpingitis. Menge refers to statements often made as to the importance of the presence or absence of fever in the diagnosis of the cause of salpingitis. His observations show that in salpingitis from the gonococcus, the streptococcus, or the staphylococcus, or in salpingitis with sterile pus, fever may be present or may be absent; so that from temperature no conclusion can be drawn as to the cause of salpingitis.

Menge concludes his report on the bacteriology of the Fallopian tubes with some paragraphs on treatment, which his laborious researches entitle to respect. He thinks treatment should be as conservative as possible, and for this reason prefers abdominal section. He approves neither of the opening of pus sacs by the vagina nor of the vaginal extirpation of the uterus and its appendages. He disapproves the former because in suppurated tubes and ovaries there are often several suppurated cavities, and these cannot all be with certainty opened up. He looks upon the vaginal extirpation of the uterus and tubes as a mutilation inconsistent with the conservative principles which should guide surgery. He thinks the parts should be examined by abdominal section. Sometimes what is thought to be a pyosalpinx

* "Year-Book," 1894, p. 325.

will prove to be a hydrosalpinx, and the tube can be opened and left in its place. If pyosalpinx be present, a more permanent result will be gained by cutting out the part of the tube which traverses the uterine wall, carefully sewing up the uterine horn, and leaving the ovary, if healthy, behind.

The last section of the work is devoted to the bacteriology of the *ovary* and *peritoneum*. Menge points out that the ovary differs in three ways from the other genitalia: (1) It has no direct connection with the genital canal. (2) It is a gland which has no excretory duct, its products being liberated by a periodical laceration of its tissue. (3) It oftener than other parts undergoes changes—viz. the different kinds of cystic degeneration—which make it furnish abundance of nutritive material for microbes. From these peculiarities it results that microbes comparatively seldom enter the ovary from the Fallopian tube, but that the ovary is more liable than other parts of the genital system to be invaded by microbes reaching it by blood or lymph channels. The organisms which reach the ovary may be divided into two classes: (1) The gonococcus and the tubercle bacillus, which cause a peritonitis which is not quickly fatal. (2) The streptococcus pyogenes, staphylococcus pyogenes, and bacterium coli commune, which when they reach the peritoneum cause quickly fatal peritonitis. These probably invade the ovary oftener than is thought, but as the patients soon die, their effects on the ovary have no clinical importance. The gonococcus and the tubercle bacillus, when they reach the surface of the ovary, lead to the production of false membranes covering it, and this leads to cystic oöphoritis with infiltration of small cells. The microbes do not penetrate the ovary unless their advent should coincide in time with ovulation. If they do penetrate the ovary, they cause suppuration. They find excellent nutriment in the corpus luteum. The suppuration may take the form of a true abscess, with breaking down of the ovarian tissue, or it may be limited to a cyst, a condition which Menge calls a pseudo-abscess. Ovarian abscesses are sometimes found with healthy tubes; in these the infection must have reached the ovary in some other way than by the tubes. The streptococcus pyogenes may set up puerperal endometritis, and travel from the endometrium to the ovary by the lymphatics; or from septic thrombi in the uterine vessels microbes may travel in the blood stream to the ovary. Saprophytes may thus get to the contents of an ovarian cyst. The tubercle bacillus may also travel in this way. Microbes may enter an ovarian cyst from adherent bowel. Out of 37 cases of ovarian suppuration Menge was able to detect the causing microbe in 19. Of these in 9 it

was the gonococcus, in 4 the tubercle bacillus, in 4 the bacterium coli commune, in 1 a saprophyte, and in 1 the streptococcus pyogenes. In 90 per cent. the suppuration was unilateral only. Menge agrees with Olshausen that the bacterium coli commune is the commonest cause of suppuration of cystic ovaries. Gonorrhœal ovarian abscesses are generally puerperal. Menge finds ovarian suppuration present in about 25 per cent. of cases of suppurative salpingitis; but as the ovarian suppuration is generally one-sided, it will be possible in most cases to preserve one ovary; and in young subjects this, if possible, should be done. Clinical experience has yet to show the results of partial resection of ovaries.

Lastly, Menge speaks of the *peritoneum*. No organisms are found in a healthy peritoneum. Menge has examined 32 cases of peritonitis in women. Fifteen of these were tuberculous; in 4 it was probably gonorrhœal, but the gonococcus could not be found; in 8 the streptococcus pyogenes was present (in 5 after operation, in 3 after childbirth); twice the gonococcus of Neisser was found; twice the bacterium coli commune (both operation cases); and once a saprophyte. Menge holds that his own observations and those of Wertheim show indisputably that the gonococcus alone, without other organisms, can set up peritonitis.

His general conclusion is that in the non-pregnant female the gonococcus and the tubercle bacillus overshadow every other micro-organism as the most common and the most serious producers of disease; the reason being that these organisms can penetrate the uninjured epithelium and maintain themselves in the tissues. In the puerperal woman the streptococcus and the staphylococcus have a larger *rôle*, because here there are large wounds through which they can enter. Having entered, they either kill the woman quickly or produce disease from which she completely recovers. They seldom produce chronic disease, and therefore are rare in the genitalia of non-pregnant women.

The next paper which I refer to contains instructive facts bearing on the prognosis after the removal of tumours which show, or are attended with, the histological or clinical evidence of malignancy.

2. The results of operations on malignant tumours of the ovary.

Kratzenstein has written a useful paper on this important subject (*Zeit. für Geb. und Gyn.*, Bd. xxxvi.), which may help the practitioner in advising about, and in prognosis after, operation.

The death-rate after removal of benign ovarian tumours Kratzenstein puts at 5 per cent. But with malignant tumours the case is different. The most important statement of the operative

results in cases of malignant tumour published before Kratzenstein's paper was that of **Cohn** (*Zeit. für Geb. und Gyn.*, Bd. xii.). His collection of cases showed an immediate mortality of 20 per cent., recurrence in 15 per cent., cure in 19·5 per cent.

Kratzenstein has analysed 100 cases of removal of malignant ovarian tumours in the clinic of **Prof. Olshausen.** The death-rate was 28 per cent. Of these 2 were cases in which it was impossible to complete the operation. Eleven died from septic infection. In 5 the patients died from metastatic or generalised growths of the tumour. Four died from shock—it is supposed from atrophy of the heart muscle, although this was not proved. One died from the effects of pedicle twisting on a sarcomatous tumour, 1 from bleeding, and 4 from intercurrent disease. As to the kinds of tumour, 5 were fibro-sarcoma, 2 sarcoma, 6 carcinomatous papillary cysts, 7 carcinomatous multilocular cysts, 8 pure carcinoma.

There remain 72 cases which recovered from the operation. In 34 of these the growth recurred. These were: Two sarcomata, 12 carcinomatous multilocular cysts, eleven carcinomatous papillary cysts, and 9 carcinomata. Sixteen cases of fibro-sarcoma which were operated upon remained free from recurrence; they were mostly small and free from adhesions; only 4 were larger than a child's head, and in 4 only there were easily broken down adhesions. There were 18 cases of pure carcinoma; 8 of these died from the operation, and in 9 recurrence took place, or in 90 per cent. Of carcinomatous multilocular cysts there were 27; 7 died from the operation, and in 12 recurrence took place, or 60 per cent. Of 24 carcinomatous papillary cysts 6 died from the operation, and in 11 recurrence of growth took place, or 61 per cent.

Thirty-one patients remained alive and well at least five years after the operation. Five others have since died from intercurrent disease of a different kind, and therefore may be regarded as cures so far as their ovarian disease is concerned. These figures are better than the results shown by Cohn's collection of cases, and therefore indicate advance, and justify us in holding out greater hope than we were formerly able to do.

The modes of recurrent growth are four: (1) Local or wound recurrence—that is, cancer growths in the wound, due, as some would say (of whom I am one), to accidental inoculation of the cancer protozoon on the wound surface. Of these there were 12. (2) Recurrence in lymphatic glands, which occurred in 3 cases. (3) Metastatic growth in distant parts, which were

observed in 9. (4) Continuous growth of the original tumour, which took place in 8 cases.

I next quote a paper on some minor changes in the ovary, which are important as causes of pain. The paper shows us how we may in many such cases remove pain.

3. The ignipuncture of painful ovaries.

Pozzi has published a statement of the results of this practice —one which he initiated (*Révue de Gynécologie*, Jan.-Feb., 1897). This operation is done for two purposes: (1) To prevent cystic growth by destroying small cysts; (2) to cure ovarian pain. The resection of ovaries—that is, the removal of the diseased part of an ovary, leaving the healthy fragment behind—was first deliberately practised by **Schroeder** in 1884. Since then Schroeder's example has been followed by others; and it is now established that such an operation is safe, and that if only a small piece of ovarian tissue is left the patient may menstruate regularly and become pregnant.

Pozzi first examines the different cases in which an operator may find himself tempted to resect a diseased ovary. The cases are those in which one ovary has been removed and the other is found partially diseased. Such cases may be divided into four categories:

1. Benign growths, such as ovarian dermoids and cysts which have neither colloid nor papillary contents.

2. Growths of doubtful prognosis, such as glandular multilocular cysts.

3. Growths, probably malignant, including all papillary tumours and solid tumours the nature of which is rendered suspicious by their rapid growth and the presence of ascites.

4. Chronic ovaritis.

As to the first group, it is impossible to say with certainty that an ovarian tumour is benign, for carcinomatous growth *may* take place in any ovarian tumour. Nevertheless, Pozzi holds that with tumours of this group, if the patient is young, the attempt should be made, by resecting the ovary, to preserve ovarian function.

In the second group Pozzi holds that the less as well as the more diseased ovary should be removed.

In the third group both ovaries should always be removed, whether the other ovary is diseased or not.

In chronic ovaritis the first condition for the conservative treatment is that the tube be healthy. An operation is dangerous which leaves an infected tube opening into the peritoneal cavity. If the only disease about the tube is the closure of its fimbriated

end by soft and weak adhesions, so its fringes can easily be opened out and its canal made patent, Pozzi thinks this may be done.

Pozzi describes what he means by "chronic ovaritis." In some cases the lesion is an advanced sclerosis without notable cystic disease. Sometimes the ovary is enlarged, but usually small and, as it were, dried up. Such ovaries are often seen in women long past the menopause, and then the change is senile rather than pathological. But this change is not always present in old women, and when it is present we know not what the menstrual history has been. Whatever it be, it clinically goes in young women with dysmenorrhœa, sometimes intolerable. Such ovaries are ordinarily degenerated throughout their whole extent, and their removal is the only thing that can effect a cure.

In other cases there is cystic degeneration of Graafian follicles. These ovaries may be divided into three classes: (1) Cystic follicles; and (2) cysts of the corpus luteum. These cysts vary in size from that of a small nut to that of a walnut; their contents are serum or blood. The ovary may be so invaded by such cystic degeneration that there remains hardly any healthy tissue. (3) Sclero-cystic ovaritis. The characteristic of this form is the smallness and multiplicity of the cysts. They are scattered through the ovary, and are from the size of a millet seed to that of a pea. Pozzi remarks that some persons do not regard this change as pathological, and admits that it is met with in ovaries that have never given any trouble. But it is certain, he states, that in a great number of women suffering from troubles of ovarian origin, the only lesion found when the belly is opened is "sclero-microcystic ovaritis"; and that cure follows the complete or partial removal of the organs thus altered. He makes two varieties of the disease: The sclero-microcystic, and the œdematous microcystic, terms which sufficiently explain themselves. When these conditions are found, it has been the practice of most operators to remove the organs. Routier has maintained that the process is a progressive one, and that, therefore, a conservative operation is doomed to failure. Pozzi, on the contrary, treats such cases by removing or destroying the diseased parts of the organ, and preserving the healthy part. **Spencer Wells** and others have treated small cysts of the ovary by opening them with a bistoury. But if only this is done, Pozzi thinks it certain that the cysts will refill. He therefore, if cysts are crowded together at one part of the way, cuts out the diseased part, and then sews together the cut surfaces of ovary left. If the situation of the cysts is not such that it is convenient to do this, Pozzi punctures and destroys the wall of each

cyst with the actual cautery. In the œdematous form Pozzi often lays open the ovary along its whole length with the cautery knife, and then more thoroughly cauterises the cysts thus laid open. After discussing some theoretical objections, Pozzi states his results. He has done these conservative operations in 62 cases. In 8 the operation was so far a failure that a subsequent radical operation had to be done; but in some the recurrence of pain was due to infection after the partial operation. This leaves 54. In 4 of these the operation has been done too recently to permit of judgment as to its effects. Pozzi has been unable to watch the after course of 10. Of the remaining 40, 33 have been either entirely cured or much ameliorated, and 7 say that their condition is about the same as before the operation. Twelve of them have become pregnant since the operation.

I think that this operation, introduced by Pozzi, of the ignipuncture of painful ovaries, promises to be a distinct addition to our therapeutic resources. I have in several cases performed the operation, and the patients have afterwards said they were better. But I have not yet watched the patients long enough to satisfy myself that the relief to pain was due directly and entirely to the operation, and was not due to rest in bed or to suggestion. It must be admitted that we know nothing as to why these ovaries are painful, for similar changes are often seen during abdominal section, and after death, in the ovaries of women who did not suffer pain.

When a movable ovary is so painful that the patient is urgent for relief, even though it be by operation, I think the best way of getting at the ovary is by anterior colpotomy. Pozzi relates a case in which he attributes death to anterior colpotomy. The case was one in which he had removed one ovary, and ignipunctured the other. On the twelfth day after operation pelvic pain led to examination, and a mass of effusion was felt round the pedicle of the ovary which had been removed. Pozzi inferred that there was an abscess, and tried to get at it by anterior colpotomy. He found no abscess, but his exploration resulted in tearing a piece of bowel which was adherent to the pedicle. This was a disastrous event; but I think it should not be put down to anterior colpotomy, for the accident would have been as likely to happen if Pozzi had explored by the abdomen.

The next paper relates to a modification of the operation for the removal of incurably diseased uterine appendages. This modification its author regards as an improvement, although, as will be seen, it is too soon to say this. It has been made possible by the introduction of the raised pelvis position for laparotomy.

4. The abdominal removal of the uterine appendages without preliminary ligatures.

The French school of gynæcology are applying to intra-peritoneal surgery the methods which are used in the surgery of other parts. **Doyen** and **Richelot**, in hysterectomy, aim at tying the vessels separately, instead of in a bunch with other tissues. **Delbet** (*Revue de Gynécologie*, Mai-Juin, 1897, p. 562) has applied this principle to the operation for the removal of diseased uterine appendages. He says that the shadow upon all operations for the removal of diseased uterine appendages is the persistence of pain after operation. He is convinced that the continuance of pain is due to the following causes: (1) The constriction of and dragging upon the pedicle by the "ligature *en masse*." (2) Infection of the ligatures, not virulent enough to bring about grave accidents, but sufficient to cause inflammatory exudation. (3) Leaving behind a stump of the tube, which is always done when the ligature *en masse* is used. (4) Adhesion of the pedicle to bowel or bladder. (5) Abnormal position of the uterus. Holding these views, Delbet performs the operation in a way different from that generally practised. Having broken down adhesions and brought the appendages outside the belly, his proceeding differs according to whether the pus sac has been ruptured or not. If not, he considers that his hands and sutures are surgically clean. He puts a ligature through the broad ligament, and ties in one bundle the utero-ovarian pedicle. Then he cuts through the broad ligament and treats it in the way to be presently described. If the appendage has been torn in extracting it, so that the operator's hands are soiled with the contents, and a ligature will also be infected if applied, Delbet cuts through the broad ligament without any preliminary ligature. He begins at the external border, and as vessels bleed they are caught up by his assistant with pressure forceps. (This is only possible if the patient is in the raised pelvis position.) The uterine artery is the important one; the ovarian artery is only important during pregnancy. Delbet takes care to cut away the ovary completely, but avoids the round ligament. The jet of the uterine artery is seen when the operator cuts near the uterus. Four or five vessels generally have to be tied. Delbet cuts away the tube as close as possible to the uterus, so that, as he says, he almost cuts away a uterine cornu. Having cut away the diseased parts and secured all the vessels with forceps, Delbet carefully purifies his hands and the field of operation. Then he cauterises the uterine end of the tube, and ties the cut vessels. There is left a long wound in the peritoneum, extending from the uterine cornu to

the pelvic brim. This he carefully closes with Lembert's suture, using the round ligament to cover its inner part. Thus all ligatures are buried under the peritoneum, and no bleeding surface is exposed. By this method there is none of the dragging produced by ligatures *en masse;* the stump is not infected by hands or ligatures; the tube is removed without the smallest nodule being left, and as no bleeding surface is left the probability of subsequent adhesions is diminished. Delbet at the same time corrects by ventral fixation any abnormal position of the uterus. Delbet has not practised this operation long enough to be able to give information as to the remote effects, but he finds that this new technique almost completely suppresses pain immediately following the operation.

The untoward results which sometimes follow abdominal section are also the subject of the next paper I quote.

5. On adhesions and intestinal obstruction after abdominal section.

Intestinal obstruction is a possible cause of death after abdominal section which at present cannot be said to be entirely under the surgeon's control. Many causes have been assigned for it, and preventive measures recommended. These are the subject of a careful paper by **Dr. Uhlmann,*** who has studied the subject with the help of the records of **Prof. Zweifel's** clinic at Leipzig. Uhlmann gives a summary of the work of those who have preceded him in the study of this subject. As causes assigned for it we have the presence of dead tissue; the pedicle and wound ligatures; adhesion of bowel to stump, to injured parietal peritoneum, or to omentum, pieces of which have been tied and cut off; adhesion of coils of inflamed bowel to one another; incarceration of bowel by bands or sacs formed in the peritoneum after operation. It is clear that obstruction comes from adhesions of bowel, and the problem is how to prevent their formation. The latest and most plausible theory is that bowel becomes adherent whenever its epithelium is damaged and it comes into contact with the abdominal wound. **Walthard,** who studied the subject by experiments on animals, came to the conclusion that when a healthy serous membrane is long exposed to the atmosphere the uppermost cells of its epithelium die. If two surfaces of peritoneum so affected are brought into contact they adhere. Walthard ascribed this death of epithelium to drying. He found that a fatal peritonitis could be produced in a peritoneum dried by exposure by a one-thousandth part of the dose of microbes which would set it up in a healthy peritoneum. The

* *Arch. für Gyn.*, Bd. liv.

practical conclusion from Walthard's experimental research was that it is essential to keep the peritoneum moist—not to sponge out fluid but to wash it out. Walthard had better results with this "moist asepsis" than he had previously had with "dry asepsis." Sänger, in the year following, also championed "moist asepsis" against "dry asepsis." Out of 132 cases operated on by the "dry" method, Sänger had 10 deaths, 5 of them from intestinal obstruction; while among 76 in which "moist asepsis" was used there was no case of ileus, and recovery was smoother.

Uhlmann's paper is to test these methods by the results of Zweifel's practice. That surgeon's abdominal operations are divided into three groups, (1) 246 cases treated by "dry antisepsis"; (2) 481 cases by "dry asepsis." [The difference between antisepsis and asepsis is that in the former germicide solutions were used, in asepsis sterilisation by heat.] (3) Eighty cases by "moist asepsis." In testing the results Uhlmann first eliminates those causes of death which are independent of septic causes—such as hæmorrhage, cardiac disease, cancer, and peritonitis depending upon suppuration present before the operation. The deaths that seemed connected with defective methods of attaining asepsis were in the antiseptic period 2·44 per cent. in the "dry asepsis" period 0·6 per cent., and in the "moist asepsis" period 1·25 per cent. Zweifel's experience therefore goes to show that asepsis is better than antisepsis, and that "dry asepsis" is better than "moist asepsis." Turning next to the question of intestinal obstruction, the percentage of intestinal troubles following the three different series of operations was, in the antiseptic period 3·56 per cent., under "dry asepsis" 3·3 per cent., under "moist asepsis" 5 per cent. Zweifel's experience therefore goes to show that it is better to leave the peritoneum dry than to pour in fluid; although the difference is so slight as to show that the matter is not one of great importance.

The remaining question is the prevention of adhesions. In last year's "Year-Book" I referred to a recent law suit, in which it was strongly urged that when one ovary was found much diseased and the other only slightly diseased, it was proper to leave the less diseased ovary, in the hope that the disease might not progress; for that if the disease did advance, the second ovary could be removed at a second operation, with no greater risk than that attending the first operation. The question arises, Is this so? Uhlmann records 23 cases in which a second operation had to be done soon after the first. In every case adhesions were found of bowel or omentum to the stump

the abdominal scar, and to places in which the peritoneum had been injured, either by breaking through adhesions or applying ligatures. But he never found adhesions between two surfaces of peritoneum both of which had been left uninjured at the first operation, however much the peritoneum may have been exposed to the air.

The next paper is a small contribution to a great subject, but it is one which helps to make our knowledge more definite and more correct.

6. The etiology and treatment of uterine cancer.

Bäcker (*Arch. für Gyn.*, Bd. liii.) analyses 705 cases of uterine cancer occurring in the clinic of **Prof. Kézmárszky** at Buda-Pesth. His paper does not contain any novel opinion, but is valuable as bringing the support of large numbers to opinions sometimes advanced without enough evidence. Bäcker shows that the years of life in which uterine cancer is most prevalent are the later years of sexual life—viz. from forty-one to forty-five. That women who suffer from cancer have, as a rule, had larger families than the average. That it is only in a very small minority that the cancer rapidly follows delivery; in most an interval of years elapses after child-bearing before cancer growth begins. Bäcker sees in this an argument harmonising with the observations of Sir John Williams and Fehling, who failed to discover that lacerations of the cervix had any etiological bearing upon cancer. Bäcker asks, How is it, if cervical lacerations cause cancer, that ten or twenty years often elapse after the laceration before the cancer begins? He refers to the rarity of cancer with prolapse as a fact telling against the influence of irritation of the cervix. Bäcker thinks the relationship between cancer and the having had many children is best explained by supposing that puerperal cervical endometritis predisposes to cancer; but I cannot say that I think his argument very cogent. He does not attribute a similar effect to gonorrhœal inflammation on the ground that cancer is comparatively rare in prostitutes. He finds that cancer of the vaginal portion occurs in younger subjects than other forms, being comparatively most frequent from thirty-one to forty; cancer of the cervix being, as compared with other forms, more frequent from fifty-one to sixty, and cancer of the body after sixty. He, like **Prof. Sinclair**, of Manchester (in Allbutt and Playfair's "System of Gynæcology"), lays great stress on the friability of the growth as a means of diagnosis; and in this I agree with him. Lastly, Bäcker gives statistics of the operation results. The cancerous uterus was extirpated seventy times in the Buda-Pesth clinic, with eight deaths, or 11·6 per cent. In eight a vesico-vaginal

fistula followed the operation, and in one the rectum was opened. These results are not brilliant; but as a candid statement of what may happen after the operation done by experienced hands they may be a useful warning to any who will lightly undertake it without experience. Among those who recovered 33 per cent. were cured, meaning by cure that they lived three or more years without recurrence. The best results so far attained after this operation are those of Kaltenbach, whose mortality was 3·9 per cent.

The operation performed by Kézmárszky has always been the removal of the uterus, not amputation of the cervix, for three reasons: (1) That the disease is more completely removed; (2) that amputation of the cervix leads to stenosis and dysmenorrhœa, and, if pregnancy follow, to abortion; (3) that recurrence is less frequent after extirpation than after amputation. I doubt the assertion implied in the first and third of these reasons; the second is a valid and, in my opinion, sufficient reason for preferring total extirpation.

7. Hysterectomy.

The questions that at present occupy chiefly the attention of gynæcologists are those connected with hysterectomy. These questions refer to two things: (1) The technique of the operation, and (2) the cases for which it should be advised.

(1) As to the technique. Up to 1889 every method of intra-peritoneal treatment of the stump left after removing a fibroid had proved a failure. ["Intra-peritoneal treatment" means suturing or in some way securing the stump, dropping it, and closing the abdominal wound.] The only method which was at that time safe was securing the stump in the abdominal wound outside the peritoneum by a clamp that could be tightened up if necessary. The disadvantage of this method is that the part of the stump beyond the pedicle has to be separated as a slough, either by the natural process or by the surgeon cutting it away ten days or so after the operation. After this is done, the surface of the stump left has to heal by granulation. Convalescence is therefore slower. To wait for a part to be cast off by gangrene is a practice which in other departments of surgery has been long superseded by quicker methods, and therefore the opponents of the clamp are not without theoretical justification in calling it "unsurgical." But, nevertheless, to call the clamp "horrid," "barbarous," "unsurgical," etc., is a question-begging objection. If the clamp gets the patients well more surely than any other way of treating the stump, it is the surgical method. At a discussion of the subject by the Obstetrical

Society of London in November, 1897, so experienced a surgeon as **Meredith** stated that he was not prepared to give up the clamp. The long convalescence is not so weighty an argument as it may at first appear; for operators very fond of surgery seem to forget what a grave nervous shock to a patient a severe operation is, and this is the same whatever the method used. If the clamp is used, the patient will have to keep her bed two or three weeks longer than if it had not been used; but the length of time that will elapse before she regains her former nervous tone will be much the same whatever the method by which the pedicle is treated.

In 1889 **Stimson** introduced the ligature of the uterine arteries as a part of the operation, and this has made it possible to drop the pedicle, close the abdominal wound, and dispense with the clamp. Since then discussion has mainly turned on the method of ligature. The earliest proceeding was to tie the broad ligament in masses as thick as it was safe to trust in the grasp of one ligature, and either tie a similar bunch, including the uterine artery, or else by dissection more or less isolate the uterine artery so as to include in the ligature little beside it. This was done on both sides, and then the body of the uterus was cut away at or near the level of the internal os. This has been modified in two ways: (*a*) By cutting away the cervix also; (*b*) by tying the vessels after cutting through them, not before. (*a*) If the cervix is to be removed, the ligatures on the uterine artery must be put farther from the cervix. This brings with it danger of including the ureter, and the uterine artery must therefore be more carefully isolated. When the cervix has been cut away the ligatures may either be cut short or brought down through the vagina, so as to bring down and oppose to one another peritoneal surfaces. (*b*) **Doyen**, of Rheims, first pushes up by the vagina its anterior and posterior fornices and opens them, thus more extensively and surely separating the bladder and ureter from the uterus. Thus he cuts through the broad ligaments from above downwards, picking up the bleeding points as he goes. **Richelot** (*Revue de Gynécologie*, 1897) does the whole thing from above. He has the wound held open by a broad retractor, and cuts through the lateral attachments of the uterus from above downwards, an assistant being ready with forceps to catch every bleeding point as it spurts. When the vaginal attachment is reached, Richelot cuts round close to the cervix with scissors. Then, having removed the uterus, the vessels grasped with forceps are tied in turn.

The latest American modification of the operation is to tie

and cut through the broad ligament on one side from above downwards; then the uterine artery; then to cut horizontally through the uterus, and tie and sever its attachments on the opposite side from below upwards. This method and that of Doyen are those which find favour in the eyes of **Segond** (*Revue de Gynécologie*, 1897).

The operation in which the cervix is removed differs from that in which it is left behind, in that (1) the pelvic floor is weakened by cutting a part out of the middle of it. This, one would think, might produce a tendency to vaginal prolapse. I have known such prolapse follow vaginal hysterectomy, and therefore believe it may follow abdominal; but I know of no operator who has published any report of the after well-being of his patients. (2) It is, as I have pointed out, more difficult from the necessity for tying the uterine artery farther away from the cervix. (3) The latest German bacteriological researches go to show that one function of the cervix is a bactericidal action—that it keeps bacteria from ascending from the vagina into the body of the uterus. From these two latter features one would expect the mortality of this so-called "pan-hysterectomy" to be higher than that of hysterectomy. It is not surprising, therefore, to find that **Olshausen**, who has collected ("Handbuch der Gynäkologie," herausgegeben von J. Veit, 1897) 806 cases of amputation of the body of the uterus, treated by the intra-peritoneal method, the cervix being left, and 520 cases of total extirpation of the uterus, the so-called "pan-hysterectomy," finds that the mortality of the former operation was 5·6 per cent., of the latter 9·6 per cent., or nearly double. One would think that it was safer to tie vessels before cutting through them than afterwards; at least, the patient by the former plan loses less blood. These seem to me the great points in the comparison of the different methods of operating; all others are comparatively unimportant.

(2) The other question which is now being much discussed is much more important. In the "Year-Book" for 1895 I quoted American surgeons who have gravely urged that *all* fibroids should be removed, on the ground that if they are not causing trouble now they will at some future time. At a recent meeting of the Obstetrical Society (*Brit. Med. Journ.*, Nov. 13, 1897) **Mr. Bland Sutton** read a paper, in which he said "it was becoming a plain duty to point out to patients with uterine myomata, as was done with those who had ovarian tumours, that the earlier the tumours were removed the less the operative dangers." It ought to be borne in mind that the prognosis of a fibroid is not like that of an ovarian cyst. The ovarian cyst will grow, the

fibroid will not. True, there are a few tumours clinically indistinguishable from ovarian cysts (parovarian, simple cysts, dermoids) which may remain stationary a long time, and even undergo natural cure. There are also fibroids which grow to a great size, or degenerate and cause great trouble. But these are exceptions. When the presence of an ovarian cyst has been diagnosed by a competent surgeon, the rule is that it will go on growing until it kills the patient. But when a small fibroid that is causing no trouble is accidentally discovered, the probability is that it never will cause trouble. I therefore cannot agree with what Bland Sutton implies—viz. that the advice given to patients with small fibroids should resemble that given to patients with ovarian tumours. At the same meeting (and at former meetings) small batches of extirpated fibroids have been exhibited, apparently to show that patients might survive the operation. One of them was a small submucous fibroid, about the size of an orange, which, in the opinion of many present, could have been easily and safely removed by the vagina, a mode of treatment which would have left the patient unmutilated, and have spared her the risk of abdominal section.

In deciding whether or not a fibroid should be removed, the ultimate judge is, of course, the patient. But she will be influenced by what she is told of the consequences of the alternative courses before her. What are these? Take the case of a woman who has a fibroid which has attracted attention by its size, but which is not large enough to cause distress. Suppose she lets it alone. What will happen? Her belly will remain big, and may get a little bigger. It is possible that it may get very big. It is also possible that degeneration of the tumour may set up inflammation, or that it may get incarcerated or adherent in such a way as to interfere with other organs by its pressure. But these things are very unlikely. The probability is that an increase of an inch or two in her waist measurement will be all the trouble that her tumour will give her. Suppose that the tumour is removed. Some mishap during the operation may kill her in a few days, and the cause of death may be one, such as intestinal obstruction or tetanus, beyond the operator's control. This is unlikely, because, while the tumour is small and the peritoneum healthy, the operation is easy and tolerably safe, but it is possible. The mortality of these operations is not less than one in twenty. If she recovers, she will have three weeks in bed, and it will be months before she regains the tone of her nervous system. The days following the operation will be very unpleasant ones, marked by vomiting, thirst, pain, and anxiety.

After she gets up she will have a scar, a weak place in the belly wall, which even years afterwards may give way and allow a hernia to protrude and possibly get strangulated. If she be young and the ovaries have been removed, the menopause, with atrophy of the remaining genitalia, will come on prematurely. None of these things are desirable. What does she gain by submitting to all this? Nothing but a slightly smaller waist, and security against some contingent but improbable dangers. I think a sane woman will prefer to wait as she is.

I have referred above to a case in which a patient was deprived of her uterus as a cure for a fibroid which some thought could safely and easily have been removed by enucleation, while others at the meeting spoke of enucleation as being more dangerous than hysterectomy. The apparent conflict of opinion is explained by the different proceedings to which the term enucleation is applied. Thus I find a case reported in which first of all five laminaria tents were inserted, and then, under ether, the lower portion of the tumour was separated from the uterine wall. A week afterwards, laminaria tents were again inserted, and attempts made with the finger, volsella, cephalotribe, and midwifery forceps (!) to remove the tumour, but in vain. Lastly, the operator cut away as much as he could with scissors. The patient died. I quite agree that this sort of thing is more dangerous than hysterectomy. But I do not call this the proper way of enucleating a fibroid. The essential features of enucleation are (1) dilatation of the cervix till it will admit two fingers; (2) cutting up the tumour into little bits, and removing a bit at a time; (3) strict antisepsis throughout. In this way a submucous fibroid as big as a fœtal head can be easily and safely removed. The mortality of attempts such as I have quoted is not the mortality of enucleation but the mortality of bad surgery.

The above remarks do not apply to hysterectomy for tumours so large as to destroy the patient's health or comfort, or in situations such that any increase in size will bring about dangerous pressure effects, nor to rapidly growing tumours, nor to bleeding fibroids too large to be dealt with by the vagina. But the performance of hysterectomy as the routine treatment for all fibroids is not, in my opinion, good surgery. I have put the mortality of hysterectomy as being at least 5 per cent. This, I think, is an under-estimate. It is the lowest shown in Olshausen's collection of cases from various sources (*vide supra*). Such compilations generally understate mortality, for successful cases find their way more easily into print. Mr. Sutton's mortality was two out of

28, or 7·75 per cent. **Polk** (*American Gynæcological and Obstetrical Journal*, Sept., 1897) has published his whole experience, extending over fourteen years, and it shows a mortality of 12·98 per cent. How different the views taken by different operators as to the necessity for operation may be is shown by the fact that Mr. Sutton in eighteen months met with 28 cases calling for hysterectomy; while **Dr. Lusk** at the Bellevue Hospital, New York (*American Gynæcological and Obstetrical Journal*, Sept., 1897), in three years only met with five. Lusk's views on the treatment of fibroids will be found in the "Year-Book" for 1896.

I next quote an account of a mode of treatment which may be found useful in the case of patients who object to radical treatment. I should have thought that a collateral circulation would so soon be established that the operation would prove useless, but *à priori* prejudices must give way to facts.

8. The ligature of the uterine arteries as a means of stopping hæmorrhage from fibroids.

When a main artery is tied in a limb we know that an anastomotic circulation is very quickly established. The temporary arrest of the blood current to an aneurysm a little way below the ligature lasts long enough for the coagulation of enough fibrin to fill up the aneurysm; but the nutrition of parts situated farther away from the ligature of the artery is hardly affected at all. With this fact in mind, it does not seem to me that on *à priori* grounds much is to be expected from cutting off part of the blood supply of a uterine fibroid. For this reason, although this treatment was proposed five years ago and has frequently been the subject of comment since, I have not previously thought it worth while to take up space in the "Year-Book" by a reference to it. But *a priori* opinions must always yield to observed facts. **Franklin H. Martin**, of Chicago, who in 1892 originally proposed this therapeutic measure, put before the meeting of the British Medical Association at Montreal his experience of its results, and his views as to the cases for which it is specially suitable.

Martin defines the aim of the operation as being both to cut off a large part of the blood supply of the uterus and to change the nutrition of the uterus by interfering with its nerve supply. He does it by tying the base of the broad ligaments; and it is obvious that it could be also effected by compressing them with forceps. He also speaks of tying the whole of one broad ligament and the base of the other; but if so extensive an operation as this is done, it seems to me that it is but a very small step farther to remove the uterus. He precedes the operation by curetting,

irrigating, and packing with gauze the uterine cavity. This seems to me a complication which makes it difficult to judge which is the beneficial agent, the curetting or the ligature. But I pass this point and go on to the results.

The following are the advantages which Martin claims for this new treatment: (1) From the standpoint of mortality it is a minor operation. There is no shock nor long convalescence. In case the operation should prove a complete failure it can do no harm. (2) It does not unsex the woman. One of Martin's patients bore a child after it. (3) The operation is applicable in those desperate hæmorrhagic cases where the depletion is such that more radical measures are prohibited. It provides a means of instantly depriving these tumours of two-thirds of their blood supply. Afterwards, when recuperation has occurred, more radical measures become safe, should they be deemed necessary. Martin relates six cases of this kind. Four were cured; hæmorrhage ceased immediately, and the tumour was reduced in size and "practically disappeared." In the two others there was immediate improvement, but one relapsed; and in the other severe neuralgic pains persisted, so that hysterectomy was done. (4) This operation can be resorted to in cases of fibroids in which the mechanical difficulties in the way of a radical operation are so great as materially to increase the risk of such operation. These are few, but Martin has had one. In it "the cure was magical." He thinks there are many similar cases, and that the more frequent application of this operation would lessen the death-rate of hysterectomy. (5) Martin thinks that this operation should be given preference in all interstitial bleeding fibroids which are discovered by their rapid growth and increased hæmorrhage just as the menopause is approaching. In such cases a surgeon will hesitate before advising a woman to submit to hysterectomy when he is reasonably certain that nature, after a year or so, "will be able to do a better job." (6) This operation may be employed as a substitute in all cases of growing and bleeding fibroids where patients absolutely object to radical operations. Martin's final limiting word is that this operation is not applicable in cases of pediculated submucous or subperitoneal tumours.

In the discussion which followed **Vineberg**, of New York, said he had performed the operation in five cases of bleeding interstitial fibroids, and the results were either temporary or entirely nil. Extensive sloughing of the cervix took place afterwards, showing that the uterine arteries were completely tied off. **Professor Skene**, of Brooklyn, favoured the operation in young women with bleeding fibroids, for if the operation fail the uterus

can afterwards be removed. He thought that about one case in five could be benefited in this way.

9. The surgical treatment of retroflexion.

In last year's "Year-Book" I referred to this subject. I then expressed the opinion that in certain cases of retroflexion, in which other means of relief fail, we have in vaginal fixation a means of cure. I mentioned that it had been urged against the operation that if the patient subsequently should become pregnant, the fixation of the uterus would lead to disastrous consequences. I quoted, among others, a brief abstract of a paper read before the Geneva Congress of Obstetrics and Gynæcology by **Professor Küstner**, of Breslau. Quoting only from an abstract, it was impossible to do justice to Küstner's thoughtful, dispassionate, and laborious summary of the questions at issue. The paper has since been published as one of Volkmann's series of clinical lectures, and I think that it may interest and, perhaps, instruct the readers of the "Year-Book."

After remarking on the differences of opinion that exist as to the pathological effects of uterine displacements, Küstner thus defines his own position. He thinks that "every movable retroversion and flexion occurring in a woman of child-bearing age requires treatment, even if, as some say, it is causing no symptoms; or if, as it is more correct to say, the subject of it either is not aware of any symptoms (which is not common), or (which is frequent) the patient or her doctor has not recognised the causal relationship of the uterine displacement to the symptoms. Now were there a method of operative treatment as safe and as free from undesirable effects as a well-fitting pessary, it would have the advantage that the correction of the displacement would be permanent, and would therefore generally be preferred to treatment with a pessary." From this general proposition Küstner excepts retroversion of the gravid uterus and of the puerperal uterus.

I may say, in passing, that if a patient has no symptoms I see no reason why she should be treated either by a pessary or an operation. But as what concerns us here is the effect of the operations, I argue not this point.

In the opinion of Küstner none of the operations, even when performed in the best possible way, restores a normal state of things. But the result of each one is preferable to the condition of retroversion or flexion of the uterus.

(1) *Alexander's operation* in its original form, in which the ligament was sought for in the inguinal canal, was not certain enough. Often, especially in virgins, the distal end of the round

ligament is thin, hard to find, easy to mistake, easy to tear. The operation has been greatly improved by **Edebohls, Werth,** and **Kocher,** who have lengthened the incision, and so rendered it possible to find the ligament with certainty. Greater certainty in finding the ligament means more accurate stitching, and therefore more permanent results.

(2) *Ventral fixation.*—Küstner thinks that fixation of the uterus by sewing it to the abdominal wall is easy and certain. He thinks the permanency of the results of other methods than this of fixing the uterus after opening the belly is doubtful. I think it not worth while to describe these.

(3) *Vaginal fixation.*—Küstner, in his remarks upon the therapeutic value of this operation, takes together all the different methods of doing it, and consequently thinks that relapse frequently follows. I am not surprised that relapse should follow operations by some of the methods proposed; for I think the different methods are of very unequal value. Küstner after this refers, but not with approval, to certain proposals to fix the uterus to the back of the pelvis. I share his opinion of these, and therefore mention them not.

Next in importance to the permanency of the result, says Küstner, comes the question how far the function of the uterus is influenced by the operation.

Küstner quotes all the evidence that has been published to show that labour is apt to be difficult after ventral fixation. He holds it as to-day certain that ventral fixation of the uterus little, and only in exceptional cases, influences the function of the uterus. These exceptional cases are those in which the operation has been performed in an exceptional way. The closer operators keep to the advice of **Olshausen** the rarer will be these cases. Disturbance of labour follows not the operation but wrong performance of the operation.

Vaginal fixation of the uterus has been in some cases followed by ill consequences in pregnancy and labour. The root of these, in Küstner's opinion, is overdoing the operation, fixing the whole of the anterior surface of the uterus instead of being content with fixing the lower half only. This is enough to give a permanent result, and not enough to produce any serious consequences in the event of pregnancy. But there is an increased tendency to abortion after this operation, and this is the sole objection to it. Were pregnancy afterwards negatived, then this operation would be a valuable and indispensable addition to gynæcological surgery. No ill effects have in the event of pregnancy ever followed Alexander's operation.

Küstner then considers the treatment of fixed, adherent retroflexion. Here, he points out, operation consists of two things: First, separation of adhesions; second, fixation of the uterus in a proper position. Attempts to fix the uterus in a normal position before separating adhesions are absolutely irrational, always have failed, and always will fail. In considering the treatment of adhesions the cause of the adhesions is important. The adhesions result from inflammation set up by microbes. The microbes are of two kinds: the gonococcus and the pyogenic organisms that infect wounds. The adhesions produced by these two agents present important differences, to which enough attention has not hitherto been paid. In ascending gonorrhœa the tubes suffer most; the inflammation reaches the peritoneum by travelling along the tubes and not by spreading through the uterus. Hence, with adhesions from this cause there are also changes due to old salpingitis. But septic inflammation, on the contrary, extends through the wall of the uterus to the peritoneum before it has reached the tubal mucous membrane; and, therefore, with adhesions from this cause tubal inflammation is generally absent. Küstner thinks that although adhesive inflammation is generally caused by microbes, it is yet not improbable that, when the uterus has lain long in an abnormal position, the continued pressure upon parts which ought not to be pressed on may lead to destruction of epithelium and adhesion; for occasionally the retroverted uterus is found adherent in virgins.

The proper treatment depends upon the nature of the adhesions. With acute inflammation of the tubes or pelvic peritoneum retroversion is an insignificant factor in the case; the acute inflammation dominates treatment. When acute inflammation has subsided the proper treatment depends upon the condition of the tubes. It is only in cases in which they can be preserved that it is worth while to alter the position of the uterus. If the tubes are so diseased as to require removal, the fixation of the uterus is an unnecessary complication of the operation. Removal of the uterus along with the tubes is the best thing, and as a rule this should be done by the vagina. But cure without mutilation is the highest aim of treatment.

Assuming that the case is one in which the rectification of the position of an adherent and retroverted uterus is desirable, the next question is how to do it. The author first considers the methods, recommended by Schultz and others, of breaking down adhesions by pressure through the vagina and by massage. The latter process he condemns as too slow for practice, and too

uncertain for science. Schultz's method he also rejects because, first, it often fails, and secondly, because if the tubes are diseased it is dangerous. Great force should not be used except under ocular control. [I agree with Küstner's condemnation of both these proceeedings. I do not believe that a uterus adherent in Douglas's pouch can be separated from the adherent peritoneum by any manipulation outside the peritoneal cavity. It may be pushed up, but will then carry the adherent peritoneum with it, and fall back when the pushing is withdrawn. If there be an abscess in tube or ovary, this may be burst by such manipulations with fatal consequences.] Nor does Küstner approve of separating adhesions in Douglas's pouch through an opening in the anterior vaginal wall. He has known such a proceeding followed by hæmorrhage so great that the operator was obliged to go on to extirpation of the uterus. The proper mode of liberating an adherent uterus is, in Küstner's opinion, abdominal section in the raised pelvis position. The operator can then see what he is doing, ascertain the condition of the appendages, and control hæmorrhage. When the uterus has been freed, it is best fixed by suture to the abdominal wall.

Küstner has collected statistics of their operations in cases of retroflexion from 71 operators. He has got together 1,120 cases of ventral fixation. In 637 of these the uterus was fixed, in 443 not fixed. I presume that in the remainder information was not given. There were 7 deaths—2 of them from intestinal obstruction—a mortality of ·6 per cent. It is not stated in what proportions the deaths occurred in the non-adherent and adherent cases respectively. Relapse occurred in at least 44 cases, or 3·9 per cent. In many the result was simply stated to be "good"—an adjective which in this case is meaningless. Subsequent pregnancy was observed in 122. Delivery was normal in 74. In 15 abortion or premature labour occurred (a proportion rather below the average, which is 1 to 5). There were 1 tubal pregnancy, 3 transverse presentations, 1 case of retention of placenta, and 2 cases of Cæsarean section, for what reason is not stated.

Küstner has collected 376 cases of vaginal fixation without opening the peritoneum, and 410 in which it was opened; 786 in all. In 514 the uterus was movable, in 163 fixed. I presume that in the remainder information on this point was not given. There were 3 deaths; their causes and the class of cases in which they occurred are not stated. In 72 the retroflexion was reproduced either before or soon after the discharge of the patient. In 92 there were subsequently functional ill results,

details not given. In 23 subsequent pregnancy ran a normal course. Besides these there were 13 abortions, and one case of placental retention, and 5 complications in labour, transverse presentations, and eclampsia. Lastly, in 5 cases the retroversion recurred in childbed.

Küstner's own results are the following:—Out of 687 cases of retroflexion he has treated 292 by operation. In 140 cases the operation was ventral fixation. There were 2 deaths, 1 from diabetic coma, and the other from a peritoneal abscess opened during the operation. The result as to function was without drawback in any case. Nine pregnancies were observed with 2 abortions, 2 still births, 1 case of turning. Küstner treated 81 cases by vaginal fixation. In nearly all the uterus was movable. Out of 42 cases subsequently examined, in 12 the displacement was found to have returned. Subsequent pregnancy was observed in 9 cases. Four ended in abortion, 2 in dead-born children; in 1 forceps delivery was required. In 2 the displacement returned in the puerperium. Küstner treated 71 by Alexander's operation. Twice he failed to find the ligaments, and once he did the operation only on one side. No harm followed in either. Out of 65 subsequently examined, relapse occurred in 8. Five subsequent labours were observed, all of them natural.

I think these figures will materially help the profession to form a judgment on these operations, first on account of the large number of cases they comprise, and, secondly, because I think they show the worst effects that are ever likely to follow these operations. Adhesions in the pelvis cannot be broken down without some risk, either immediately from hæmorrhage or later from the multiplication of microbes in blood which has oozed. Hence I think that a collection of cases in which this is done will always show a mortality great enough to deter many from the operation. But when the uterus is not adherent its suture to the abdominal wall is so simple and easy a thing that, if done with clean hands and instruments, there ought to be no mortality. I regard Küstner's collection of cases as showing a mortality higher than that which belongs to fixation of the uterus, because it includes cases in which adhesions were broken down. Then with regard to the further question of the permanence of the result. It is certain that peritoneal adhesions may be absorbed, and therefore that, among cases in which peritoneum is sewn to peritoneum, in some the adhesions will be absorbed. But when peritoneum is sewn to muscle there is no reason, from experience, to expect absorption of adhesions. Küstner's statistics do not

tell us in how many cases peritoneum was sewn to peritoneum, in how many peritoneum sewn to muscle. I think it probably includes many in which peritoneum was sewn to peritoneum, and therefore shows more relapses than need have occurred. The tables of vaginal fixation include cases in which the operation was done without opening the peritoneum—a blind proceeding in which the operator cannot tell what he is doing, and after which it is not surprising that relapses should occur.

The figures show plainly enough that ventral fixation done in a proper way does not interfere with pregnancy and labour, but that it is possible to do vaginal fixation in such a way as to cause a tendency to miscarriage. This effect is not inevitable, and only follows in a minority of cases. Alexander's operation is without any effect on pregnancy or labour. I have not quoted the figures Küstner gives as to Alexander's operation, because this operation is difficult, not free from danger, and sometimes followed by relapse. By vaginal fixation the uterus can be stitched in a position of such anteversion that relapse is scarcely possible. My impression is, although I cannot adduce proof, that the better the uterus is secured in anteversion the more surely are symptoms permanently relieved, and also the more likely is pregnancy to end in miscarriage; that if only one or two stitches are put in near the os internum, pregnancy will not be interfered with but the displacement may return.

I do not recommend any of these operations for patients in whom the uterus can be kept in a natural position by a vaginal pessary, and therefore I do not find cases calling for such operations in anything like the numbers that Küstner finds them. But I am sure that there are cases in which retroflexion causes enough local suffering to spoil the comfort of a woman's life, and for various reasons vaginal pessaries are ineffective. Some of these occur in parous women, and are associated with distinct though slight prolapse. For them I think ventral fixation is the best remedy. Others occur in the sterile without appreciable prolapse. For them I prefer vaginal fixation. Most patients will prefer freedom from local pain and pregnancy, even with a possibility of abortion, to suffering and sterility.

10. On hæmatosalpinx with menstrual retention.

Meyer (*Zeit. für Geb. und Gyn.*, Bd. xxxiv. and xxxvi.) has written important papers in which he, as I think successfully, impugns the current teaching that the blood in the Fallopian tubes which often accompanies retention of menses has arrived in the tube by regurgitation from the uterus in consequence of

obstruction to its normal outflow. This is the teaching of almost every textbook, including the great clinical lectures of Matthews Duncan.

Meyer has pointed out that if blood did flow back into healthy tubes it would run into the peritoneum and be there absorbed. Its retention in the tubes is because their peritoneal extremities are closed, and were closed before menstruation began. Their closure points to the past existence of salpingitis and perimetritis. It is known that hæmatosalpinx does not always accompany menstrual retention, and the current doctrine has been that the higher up atresia occurs the less room is there to accommodate the retained menstrual blood, and therefore the greater is the probability that some of it will flow back into the tubes. Meyer shows that this is not so. He says that hæmatosalpinx is not found with atresia due to a congenital defect—a vaginal septum. But it is found with a broad atresia, whether this be high up or low down. The reason is that a broad atresia is of inflammatory origin. The same inflammation that sealed the tubes also led to adhesion of vaginal wall. The blood in the tubes comes from the diseased tubes themselves.

In the second paper Meyer considers cases of unilateral atresia with retention of blood in the vagina, uterus, or Fallopian tubes. He shows reason for thinking that many cases of unilateral atresia are due to infective disease acquired after birth by the possessors of a double genital canal. In them the hæmatosalpinx is explained also as being due to bleeding from a diseased tube sealed up by inflammation. Some are, however, congenital; notably those cases of bicorned uterus in which one horn joins the other at about the situation of the os internum. In these cases Meyer holds that hæmatosalpinx is due to an infective process. The closed half of the genital canal may be infected from the open half, either by the gonococcus or other infective organism. **Menge** quotes cases in which the closed half of the canal showed such clear evidence of inflammation as ulceration, destruction of mucous membrane, and suppuration. In these cases there is great danger from rupture of diseased tubes. In hæmatometra or hæmatocolpos the fluid can be liberated with safety by the vagina, but tubal distension can only be dealt with by laparotomy. If there is good reason to believe that hæmatosalpinx is present, laparotomy should not be postponed, for to postpone it is to expose the patient to much risk of rupture.

Meyer's valuable paper concludes with a tabulated summary of 112 cases of unilateral atresia and a full bibliography of the subject.

11. Nasal dysmenorrhœa.

Wilhelm Fliess has made a communication to the Berlin Obstetrical Society (*Zeit. für Geb. und Gyn.*, Bd. xxxvi.) of so novel a character that I quote it, although I have not yet had opportunity of testing it in practice, and my knowledge of the nose is not enough to enable me to appraise as an expert the value of the author's statements.

According to him, there is a part of the nose which, by means of the sympathetic nerve, is so closely connected with the genital organs that it should in future be known as the genital area (*Genitalstelle*). At this place capillaries do not enter directly into the veins, but pass first through a number of anastomosing convoluted cavernous blood spaces. At the time of menstruation these cavernous places swell, become cyanotic in colour, and are easily made to bleed.

Fliess divides cases of painful menstruation into two groups. In the first the pain ceases when the flow is established. In the second the pain continues although the uterus is bleeding. For the occurrence of this pain a certain abnormal condition of the nose is a necessary condition. This pain promptly diminishes when the genital area (which, if I understand the author rightly, is over the inferior turbinated bone) is swabbed with a 20 per cent. solution of cocaine. Not all cases of such menstrual pain are cured in this way, for some are hysterical—that is, of psychical origin—and not dependent upon any local change, but the majority are thus cured. Cocaine injected subcutaneously does not relieve the pain; the relief comes from the anæsthetisation of the genital sphere of the nose. If the genital area of one side only of the nose is anæsthetised, the pelvic pain on the opposite side of the body is relieved. The relief is not due to suggestion, for it takes from five to seven minutes to bring it about; and it does not follow anæsthetisation of any part of the nose except the genital area.

The disease in the nose, Fliess thinks, is of infective origin, a legacy from measles, scarlatina, influenza, or some rarer disease.

Fliess also finds that by anæsthetisation of the genital area of the nose labour pains can be much diminished. The only pain so diminished is that of uterine contraction; continuous local pain from pressure is unaffected by it.

There is at least this to be said for Fliess's recommendation, that if he be in error and his treatment useless, it will do no great harm, and in that respect it contrasts favourably with many modes of treatment which have been and are practised for dysmenorrhœa.

MIDWIFERY.

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During the past twelve months no work has been done in the department of obstetric medicine and surgery which can be said to have marked any definite advance in our knowledge. Evidence has been slowly accumulated to show that the operation of ventrifixation for prolapsus or posterior displacement has a definite tendency to raise difficulties in consequent deliveries, and must be unhesitatingly condemned. The operation of vaginal fixation is certainly open to less serious objections, but, at the same time, on the score of utility as well as on the question of its bearing on later pregnancies, must be considered as being still *sub judice.*

Evidence regarding the use of the antistreptococcus antitoxin has been again brought forward, not that the utility of the treatment can at present be regarded as assured in all cases of puerperal intoxication, but rather because it seems to be more and more apparent that no definite bad result can be attributed to the use of this antitoxin, while in a fair percentage of the cases quoted it is abundantly proved that some manifestations of special poisoning are undoubtedly removed by free and early use of this treatment.

I.—PHYSIOLOGY.

1. Deflection and rotation of the pregnant and puerperal uterus.

Milne Murray (*Edin. Med. Journ.*, Feb., 1897) discusses the various views that have been put forward to explain this condition. He considers that it is to the construction of the muscular wall of the uterus that we must look for the explanation of the tendency to rotation. The rotation and deflection persist for a few days after the expulsion of the child. He notes the curious fact that in occipito-posterior cases the deflection of the uterus is nearly always to the left instead of to the right, and it is an interesting fact that there is a fairly close numerical relationship between the

proportion of cases of occipito-posterior position and cases of left lateral deviation.

Out of twenty-six cases of occipito-posterior position observed by Milne Murray, eighteen showed definite left-sided deviation after labour. In the other cases the uterus lay in the middle line, and in none of them was the ordinary right-sided deviation observed. **Schröder** and **Stratz** have noticed the same thing, but no satisfactory explanation has been given. It is a matter of some doubt whether the position causes the deviation or the deviation the position.

2. "Is there a Positive Pressure in the Growing Pregnant Uterus?" is another physiological subject discussed by **Milne Murray** at the Edinburgh Obstetrical Society on Feb. 10. He said that the physical relations of the growing pregnant uterus might be best realised by regarding it as a sac enclosed within a distensible capsule, which was composed of the abdominal walls, the diaphragm, and the pelvic floor. Assuming the intra-abdominal pressure to be neutral at the beginning of pregnancy, the uterus as it grew would require to push aside or lift up the viscera, and a gradual increase of the intra-abdominal pressure would result. This increase of pressure could be obviated only if the abdominal muscles underwent physiological enlargement to the same extent as the enlargement of the uterus. The anterior walls bulged obviously, and the question was: Did this bulging occur with the same tension as in ordinary circumstances, or during pregnancy was this bulging attended with increase of tension due to increased pressure behind them? That this tension was increased was evident by different facts: the fœtal head in all primiparæ and in many multiparæ was kept in position in the pelvis by the tension of the resisting abdominal muscles; the walls in the majority of cases became thinner as pregnancy advanced; the presence of striæ gravidarum or cracks; the discomfort due to even slight degrees of flatulence in the compressed intestines; the shallowness of the respiration showing that the diaphragm is impeded in its action; and the projection of the pelvic floor. Separation of the walls of the uterus could only be effected by a pressure on the part of the ovum greater than that of the extra-uterine region.

II.—PATHOLOGY.

1. Placenta prævia.

Heil (*L'Obstétrique*, January 15, 1897) describes the practice now adopted at the Heidelberg Maternity in dealing with placenta prævia. The membranes are first ruptured so as to

bring down the head. When dilatation is complete there is no doubt what ought to be done. But if the os remains small, and in cases where the hæmorrhage begins before labour, antiseptic plugging of the vagina and cervix is indicated. Braxton Hicks's method is dangerous for the child, but quite allowable if it be dead or hardly viable, or if the mother be in immediate danger. Heil notes 28 placenta prævia labours, 29 children being born; 4 mothers died (14·28 per cent.); 14 had high temperatures; in 10 of these the tampon had been employed; out of the remaining 14, where there was no fever, the tampon had been inserted in 6. Out of the 29 children, 19 (65·5 per cent.) were at full term, 9 delivered dead, 4 died within twenty-four hours of birth, and 16 (55·1 per cent.) survived. In 2 cases admitted with complete dilatation both mother and child were saved. Out of 19 children at term that were living when labour began, 11 were delivered alive by turning, whilst in 8 cases the tampon was applied till dilatation was complete, only 1 child being lost, and in that instance the pelvis was rachitic; all 8 mothers were saved. These statistics are favourable to the tampon.

Nyhoff (*Monats. f. Geburtsh. u. Gynäk.*, Nov., 1896) strongly objects to the routine treatment of placenta prævia centralis by the same method as is right in placenta prævia lateralis, namely, rupture of the membranes and turning. He carefully breaks through the middle of the presenting placenta and separates it from the amnion; this manœuvre is easy when the amnion is tough and not adherent to the placental tissue. The labour can then continue as in normal cases, the bag of waters dilates the os, and the chances are better for the child. No chloroform is needed, and an antiseptic tampon can be readily applied to the vagina. In lateral placenta prævia this manœuvre is not advisable, since the amnion and placenta adhere too firmly in such a case. Nyhoff also warns the obstetrician not to employ his method when pains are absent or weak, and when the amnion is closely adherent to the placenta, or gets torn during separation. Turning and bringing down the leg are needed at once in the latter condition. When pains are weak the tampon may be tried for a short time.

1a. The treatment of placenta prævia by Champetier de Ribes's bag.

Blacker, at the Obstetrical Society of London, April 7, 1897, in his paper, said that in the more severe cases of hæmorrhage from placenta prævia Champetier de Ribes's bag might be employed in place of version by introducing it into the amniotic cavity after rupture of the membranes. Used in this way the

bag acted both as a tampon in arresting the hæmorrhage by pressing the separated portion of placenta firmly against the uterine wall, and also as a dilator of the cervical canal and a very powerful stimulus to uterine contractions. The use of the bag was therefore advocated in grave cases of hæmorrhage from placenta prævia as an easy method of arresting the hæmorrhage, and at the same time as likely to reduce the heavy fœtal mortality which usually occurred in these cases after the performance of version. Blacker had treated five cases of placenta prævia in this way, and had collected seventeen others similarly treated. He gave an analysis of the chief features of interest in the cases detailed, showing that only in one case did severe hæmorrhage occur after the introduction of the bag; that such hæmorrhage might as a rule be readily controlled by traction on the bag; that in none of the cases was any difficulty experienced in introducing the bag, or was preliminary dilatation of the cervix necessary; and that the average length of time required for the complete dilatation of the cervix after the introduction of the bag was five hours and ten minutes.

Of the mothers, 1 died from septicæmia—probably present on her admission to the hospital—before the introduction of the bag. Of the others, 5 had a slight rise of temperature during the puerperium, the highest point reached being 100·6° F., while in the remainder recovery was perfect and the puerperium afebrile. Of the 22 children, 14 were born alive, and 8, or 36·3 per cent., dead. Of the 14, 4 subsequently died, giving a total mortality of 54·5 per cent. The advantages claimed for the bag were: (1) Ease and facility of introduction; (2) the certain arrest of the hæmorrhage; (3) any further hæmorrhage was controllable by traction upon the bag; (4) the bag, and not the child's body, dilated the cervical canal; (5) the ease of delivery after expulsion of the bag; (6) the fact that the bag was a powerful stimulus of uterine contraction; and (7) the lessened fœtal mortality as compared with the results obtained after version. The objections that the bag was difficult to introduce, and that preliminary dilatation of the cervix was required, were shown to be groundless. Even in cases of central placenta prævia the use of the bag was practicable and likely to give results just as good if not better than the performance of version.

Herman said that he thought the bag was a better plug than the half breech because it pressed on the whole circumference of the lower uterine segment, while the half breech did not. The hæmorrhage in placenta prævia was produced by dilatation of the cervix, hence the bag could always be introduced when

considerable hæmorrhage had occurred. His own experience of the use of Champetier de Ribes's bag in placenta prævia was altogether favourable.

Horrocks said that for some years he had used Champetier de Ribes's bag not only in cases of placenta prævia, but also in all cases where formerly Barnes's hydrostatic dilators had been used. In cases of placenta prævia, the bag had been placed in the amniotic cavity only when the membranes had been ruptured. In cases where they had been intact, care had been taken to avoid rupture. The presenting portion of the placenta had been detached by sweeping the finger round the lower zone, and then the bag had been passed into the uterus so as to lie below the membranes.

2. Ante-partum hæmorrhage.

Budin (*La Presse Médicale*, No. 64, 1896) relates the history of two cases of *ante-partum* hæmorrhage in which the blood came from a rupture in the circular sinus of the placenta. In neither case was the placenta situated in the lower uterine segment, nor was there any reason to believe as the result of careful examination of the surface that any separation had occurred before the child was expelled. A black clot in each instance was traced directly up to and into the interior of the ruptured circular sinus. The possibility of *ante-partum* hæmorrhage being sometimes due to this accident had formerly been suggested by Jacquemier and Matthews Duncan, but no clinical facts were brought forward to support the hypothesis until quite lately. At the present moment there are twenty-two cases on record of hæmorrhage due to the rupture of the circular sinus. The so-called circular sinus of the placenta is situated at the periphery of the placenta, and does not generally form a complete circle, but is interrupted at various points. In calibre it is about equal to the little finger, but in some cases it is imperfectly developed. The walls of the sinus are very thin, which may explain the fact that rupture sometimes occurs. The blood may accumulate in the uterus between the membranes and the uterine wall, or it may escape externally—more often, perhaps, some escapes and some is retained. It is only after the labour is over and the placenta is examined that the cause of the hæmorrhage can be definitely ascertained. The prognosis and treatment are much the same as in cases of hæmorrhage due to partial detachment of a normally implanted placenta.

3. Parturition during paraplegia.

Amand Routh, at a meeting of the Obstetrical Society of London on June 2, 1897, related the case of a multipara who was admitted into hospital with complete paraplegia below the level of

the sixth dorsal vertebra, the result of an accident. She was then nearly seven months pregnant. For eight days intermittent contractions of the uterus were absent, and then became more and more perceptible. After over two months labour came on 261 days after the last menstruation without the patient feeling any pain. The first stage lasted ten hours, the second two and a quarter hours. The placenta followed, aided by slight "expression," in five minutes. The patient's only sensation during a "pain" was a "tight feeling" at the epigastrium, giving her an inclination to hold her breath; but this tightness was in no sense painful. As the head was passing the vulva the patient cried out, but this also seemed a reflex act, and was unaccompanied with sensation of pain. The "pains" were not as well defined as in a normal case, the intermissions being often absent, as judged by the vaginal touch and the hand on the uterus. In fact the "pains" rather remitted than intermitted. Retraction was not good for some hours, but there was no undue hæmorrhage. Uterine involution and lactation were quite normal. Death occurred six months later.

Routh then discussed the views held at different times as regards the physiology of parturition, and cases described by Ollivier (1827), Nasse (1835), Benicke (1874), Scanzoni (1848), Paget, and Brachet (1837) were given. Experiments by Sir James Simpson (1849), von Rohrig (1879), Serres (1824), Langley and Anderson (1895-96), Riemann (1871), Goltz (1874 and 1893), Dembo (1884), and others were summarised. The evidence afforded by cases of *post-partum* parturition was also reviewed. Finally, the secondary questions of conception and lactation during paraplegia were mentioned, and the following views were given as being borne out by the facts stated:—

In pregnant women affected with paraplegia, from injury or disease of the spinal cord in the dorsal region, labour might commence at the normal period of gestation and progress in an approximately normal manner, but without sensation of pain. Involution and lactation were also normal. It was proved also from both cases and experiments that conception might take place during paraplegia. Further experiments as well as clinical facts were required before the physiology of parturition could be known, and much would be done when it was discovered with certainty what was the force by which the process of labour was initiated at the end of gestation. Meanwhile the following views seemed to be fairly established:—(1) The act of parturition is partly automatic and partly reflex, these actions corresponding in the main to the first and second stages of labour respectively.

(2) Direct communication with the brain is not essential to co-ordinate uterine action, though the brain seems to have a controlling influence upon the "pains," helping to make them regular with well-defined intermissions. (3) Direct communication between the uterus and the lumbar enlargement of the cord, through the medium of the sympathetic ganglia between the first and third lumbar, is probably essential to the regular and co-ordinate contraction and retraction of the uterus, as occurs in normal parturition. (4) It seems also probable that the uterus is able automatically to expel its contents as far as the relaxed part of the genital canal, even when deprived absolutely of spinal influence, spinal reflexes being then necessarily absent. But in the absence of reflex action the entire process of parturition would be irregularly, and probably incompletely, performed, as in Sir James Simpson's experiments and Brachet's case. (5) Lactation is not solely due to nervous influence, but partly to chemical changes in the blood, which affect secondarily the mammary glands and other tissues of the body. The chemical change in the blood is not of ovarian origin, but is probably due to the metabolism of the pregnant uterus.

4. Fatty degeneration of the uterus during pregnancy.

L. M. Bossi (*Annali di Obstet. e Ginec.*, December, 1896), in the examination of three uteri, one removed at the eighth month of pregnancy and the other two at full term, found fatty degeneration of the muscular fibres in active progress. He asks whether this is a physiological condition; and if it be so, whether it may not explain the wonderful rapidity with which involution of the uterus after labour normally takes place. Further, it may be asked whether in this fatty degeneration there exists an explanation of some cases of inertia uteri in labour.

5. The nature and diagnosis of the so-called fleshy mole.

Berry Hart (*Brit. Med. Journ.*, Oct. 24, 1896) writes:—"By fleshy mole we understand a form of abortion where part of the aborting ovum, usually at or about the second month, is retained for many months, and ultimately discharged in a much altered condition. The most marked change consists in hæmorrhages beneath the chorion which give a characteristic series of multiple elevations on the amniotic surface of the mass. Fleshy mole is not by any means a common condition, and its diagnosis is usually attended with great difficulty, and is very often not made until the actual mass is expelled. The mass thrown off, however, is quite characteristic, and the specimens all resemble one

another very much." Little has been written on the subject, although Granville, of London, figured a very fine specimen in his "Atlas of Abortion." The fullest account has been given by Breus in his able monograph, "Das tuberöse subchoriale Hämatom der Decidua," published in 1892. Hart quotes two cases. (1) The patient was married in May, 1891, ceased to menstruate in the following July, and had a threatened miscarriage on October 18, but the hæmorrhage and the pains were slight. On December 2 the uterus was the size of a two months' pregnancy, the cervix was undilated, and the patient's general condition was good: expectant treatment was advised. A few months after, the size of the uterus was the same; the amenorrhœa had continued, and the patient had no complaint to make except that she wished to know more definitely when to expect the baby. On June 20 the uterus was about the size of a four months' pregnancy, although not so broad. There had been some hæmorrhage, but the real condition was not evident until two days after, when the fleshy mole was expelled. It was an oval, thickened, fleshy mass 3 inches in diameter, ½ inch thick, and with many characteristic elevations on the amniotic surface. It was quite free from odour, was, in fact, perfectly fresh, and covered with recent blood. From her last menstruation to the complete expulsion was eleven months.

(2) The second case presented much the same clinical history, and what came away eight and a half months after the cessation of menstruation was the same as in the previous case. A careful microscopical examination of the specimen showed that the amnion, and the chorion immediately underlying it, were quite normal, and there were here and there a few villi projecting from the chorion, which were, however, almost entirely degenerated. The main mass of the sections was taken up by hæmorrhages, some old, some recent, those furthest from the amniotic surface being evidently the oldest. Beneath these was a small portion of tissue, very much degenerated, which appeared to represent part of the decidua serotina, and scattered among the strands of fibrin on its upper surface were a number of villi in the most various stages of preservation, some almost normal, some with their structure almost obliterated. The only common character which they presented was the fact that, in all, the mucoid matrix of their connective tissue was greatly increased in amount.

Hart continues:—"The fleshy mole is expelled in two forms. It may come away as a piece of fleshy-looking tissue, with its amniotic surface studded with prominences the size of the finger tip; this is really the altered early placenta. The second variety takes the form of a sac, which, on examination, is made up of

reflexa and placenta, and usually contains a little liquor amnii and a shrivelled fœtus. In the first variety the fœtus may not be present, and there is usually no decidua vera except a few shreds. This condition is essentially a fœtus change. There is death of the fœtal elements of the pregnancy, but the maternal portion of the pregnancy, the decidua, remains at first unaltered. The amnion is the fœtal membrane which changes least, and even in the eleven months' case the cellular elements are well preserved. The fœtus is, as we know, a maternal parasite, and thus the fleshy mole is an encysted dead parasite, aseptic, which the uterus tolerates long and only sluggishly expels. The sequence of events is, therefore, death of the fœtus—that is, of the chorion and its derivatives—shrinking of the chorionic sac with wrinkling of the amnion and chorion, and ultimately blood extravasation from the intervillous circulation into the protuberances. The decidua vera shrivels, but the exact changes are not known. Some of these moles are expelled in their typical conditions at the fourth-and-a-half month ; others are retained until apparently the eleventh period after conception.

"These abnormal points must be kept carefully in mind. We may have a patient with a threatened abortion continue amenorrhœic for many months, the uterus remaining about the size of a two months' pregnancy during that time. Ultimately some increase in uterine size takes place, and the characteristic fleshy mole is expelled. The medico-legal importance of such cases is evident. Apparently no case recorded has gone beyond eleven months.

"When the condition is diagnosed, the cervix should be dilated and the uterus cleaned out."

In discussing the above paper, **Fothergill** said that the two terms, "blighted ovum" and "fleshy mole," might be applied to two varieties of missed abortion, between which there is one difference. Blighted ovum results from death of the ovum, with little or no effusion of blood into it. If, however, blood infiltrates the dead ovum, blood clot is formed, which is gradually organised, and forms a fleshy mole. Placental polypi are identical in structure with fleshy moles, being caused by the retention of a portion, large or small, of placenta ; while the fleshy mole results from the retention of an almost complete ovum.

6. Albuminuria in pregnancy.

Clifford Allbutt (*Lancet*, Feb. 27, 1897) expresses his opinion that the belief that the renal complications of pregnancy are due merely to mechanical pressure is erroneous. He thinks that the evidence in favour of this theory, whether clinical or anatomical

is very weak, although it represents the current pathological teaching on the subject.

He points out that thrombosis of the renal veins is not followed by renal symptoms; that swelling of the legs and other signs of venous obstruction occur more and more as pregnancies increase in number, whereas albuminuria and eclampsia are evils of the primipara; that pressure from other tumours, such as large fibroid tumours of the uterus, does not produce serious kidney disorder; that frequently in heart disease there is increased venous blood pressure in the kidneys, but that the resulting pathological condition is by no means the same as is found in the renal disturbance of pregnancy.

In contrasting the "cardiac" with the "puerperal" kidney, Clifford Allbutt says of the latter that, "so far from being a mere congestion, there are signs of acute degenerative processes penetrating the organ in all its tissues. It is not hard as is the cardiac kidney, and it is often pale. Scattered throughout it are points, or more than points, of broken-down structure, and the anatomical elements throughout are blurred and deteriorated. Many vessels are plugged. The kidney looks as if it had been subjected rather to some more intimately mischievous—I had almost said corrosive—action than to a mere mechanical interference." In considering the vomiting of pregnancy, the headaches, faints, and even eclampsia, the question arises, Can there be any agent more directly concerned in these phenomena than "the heightened reflex excitability" so easily assigned? Clifford Allbutt draws attention to some of the symptoms of the infections, and says that if in scarlet fever we see, first, vomiting, then nervous disturbances, then albuminuria, then enlargement of the heart, we conclude that there is some toxin circulating in the body. Can it be in pregnancy that there is some circulating poison which sets up vomiting, albuminuria (which we know that other poisons do), and ultimately even eclampsia? Clifford Allbutt then reviews the evidence of the existence of such a poison, and he comes to the conclusion that the toxin does exist. The presence of a toxin, or toxins, he continues, in normal urine has been demonstrated, although the poison itself has defied detection. The kidney, therefore, is a channel for its escape, and so long as the renal functions are intact, the toxin can, and usually does, escape without doing any harm. It is not known where the toxin or toxins are found, but we can show that the liver is at fault. The toxins may be absorbed direct from the bowel, but at any rate the liver performs the function of neutralising the toxins which find their way into the circulation. The tendency

to acute atrophy of the liver in pregnant women is well established. If for any reason the liver is unable to deal with the toxin turned into the blood, the excess will fall directly upon the kidney, and probably will so injure its finer structures that albumin can leak through, and perhaps inflict serious and permanent damage on the kidney itself. A careful necropsy by Lindemann, of Moscow, in 1892 (*Centralblatt für allgemeine Pathologie*, Jena, Aug. 20, 1892), of a case of albuminuria in pregnancy clearly showed acute degenerative changes in liver and kidneys characteristic of toxic influence; the spleen also was enlarged, and neuritis was well marked in several tracts. Albumin in the urine, an early sign of a toxic condition of the system, is frequently found in pregnant women showing no other departure from health. In primiparæ the percentage is as high as five or six. As a rule, this albumin disappears within a day or two of delivery. The origin of this toxin is obscure; the toxicity of the blood in fatal cases has been found to be very high, but the evidence of the presence of a microbe is very small.

Referring to the abnormal excitability of the nervous system in pregnant women, Clifford Allbutt points out that toxins tend to expend their malignant power largely upon the nervous system, and in proportion as the nervous system is developed their effects become the more perilous. This is the case in all infections. Other symptoms which may well be due to a toxin in the blood are phlebitis and thrombosis of vessels, and the terrible susceptibility of pregnant or recently delivered women to septic poisoning. Finally, as in lead-poisoning and in Bright's disease, we find the red cells diminished both in number and hæmoglobin value.

The writer fears that he can advance no definite and immediate advantages from this toxin point of view, but he says we are enabled to see more distinctly the reasonableness of certain measures which we have empirically learned to take in cases of danger. Especially does this theory of a circulating toxin in all pregnancies assure us of the usefulness of the precaution of promoting early delivery in cases which lend themselves to this treatment. Even in dangerous and persistent vomiting, if the mother's life be in danger we must bring about expulsion of the fœtus. In eclampsia this is a still more pressing step. We shall most carefully keep an eye on albuminuria, not regarding it as a mere mechanical accident, but as the signal of a danger essentially implicated in the process of pregnancy itself. Any other signs of a toxic state must be minutely observed with a view to the prevention, if possible, of further mischief. As the

toxin may, in part at any rate, be absorbed from the bowel, a patient should be carefully dieted from the time of any suspicious symptoms, such as Chaussier's symptom of violent pains in the stomach—always a precursor of eclampsia. All substances likely to promote gastro-intestinal catarrh—that mother of poisons—should be forbidden. It may indeed be necessary to reduce the diet to milk, which we find to be the diet which lends itself least to the generation of toxins in the body. At the same time, by the administration of antiseptics we shall try to keep the bowel as clean as possible. Again, knowing now the important part of the liver in neutralising toxins, we shall jealously watch the condition of this precious organ; and, if necessary, by estimating the excretion of urea and so forth, we shall keep ourselves informed of its activity. The presence of albumin will not be overlooked, but rather we shall be diligent in search for it from early periods of pregnancy, especially in primiparæ; if we have the opportunity we may test the toxicity of the urine on rabbits; but this is not of much direct help, as a free excretion of toxin is consistent with the retention of much more in a case in which the poison is very actively formed.

To account for the more frequent occurrence of toxic symptoms in primiparæ than in multiparæ, Clifford Allbutt advances the theory that immunity is gained against the poison of pregnancy as it is against so many other toxins. Olshausen has reported that of 200 consecutive cases of eclampsia, 74 per cent. were in primiparæ.

In connection with the theory of the "toxic" origin of albuminuria in pregnancy, **Christian Simpson** (*Lancet*, July 10, 1897) publishes a note on Auto-intoxication during Pregnancy, especially referring to two conditions — viz. salivation and eclampsia. He says the amount of saliva secreted by some pregnant women may amount to many quarts in the twenty-four hours. This usually persists during the months of pregnancy only, but in some cases lasts up to the confinement, and usually disappears in a few days, though it has lasted two weeks. The saliva contains no ptyalin and less sodium salts than is normal. Bouchard has discovered a sialagogue in normal urine which he defines as "a stable organic substance not fixed by charcoal, soluble in alcohol, and distinct from the diuretic (urea) or the narcotic toxin." It is found in much greater amount in the blood, liver, and muscles than in the urine. In the case of eclampsia it must be noted that two convulsive principles are found in normal urine. Van der Velde has recently recorded experiments in which he found that pregnant rabbits are much

more sensitive to the action of normal urine than non-pregnant animals. He also found that blood from a pregnant rabbit induced convulsions with a less quantity than blood from a non-pregnant rabbit. He concludes that there is not only an increased production of toxin, but also an increased susceptibility to its influence in pregnancy.

7. The treatment of eclampsia.

This was one of the subjects under discussion at the International Congress of Gynæcology held at Geneva. According to the statistics of **N. Charles**, of Liége, eclampsia occurs once in every 151 deliveries, and is about four times as common in primiparæ as it is in multiparæ. Among every four women who suffer from albuminuria during pregnancy, one gets eclampsia. He teaches that it is most desirable to terminate delivery in all cases as speedily as possible when eclamptic convulsions set in, and, with this object in view, labour should be induced or accelerated as the case may be. In urgent cases the cervix must be dilated by the hand, or by hydrostatic bags; and if that is impossible, Cæsarian section should be performed.

Charpentier, claiming to represent the French school, said that when the patient was seized with eclampsia, and labour appeared spontaneously, all were agreed that the right treatment was to terminate labour as quickly as possible. But when eclampsia set in before labour a distinction must be made between cases at or nearly at full term and those earlier in pregnancy. The German school consider the induction of premature labour, or even abortion or forced delivery, the only treatment. Dührssen incises the cervix deeply, and if necessary the vulva and perineum. Bossi uses instrumental, others manual, dilatation; others again would perform Cæsarian section. Charpentier is convinced that induction of labour is useless and forced delivery dangerous. He concludes that: (1) The urine of every pregnant woman should be examined. (2) If the least trace of albumin is found she must be put on a strict milk diet, which prevents the production of toxins: this must be continued till after labour and till no albumin is present. (3) When œdema without albuminuria is found, the milk diet is indicated. (4) Whenever eclampsia occurs with cyanosis in a strong woman, bleeding up to half a litre must be performed. (5) Chloral should be given. (6) When convulsions have set in, milk should be given by the mouth, or, if necessary, by the œsophageal tube; this alone sometimes causes cessation of the convulsions. Besides this, the fits should be treated with chloroform inhalations, and diuresis induced by subcutaneous injections of saline solution. One must then wait till normal

labour sets in. If there is inertia uteri, labour must be terminated by forceps or version if the child is alive, by basiotripsy if dead. Induced labour is only exceptionally necessary, and forced delivery never.

Halbertsma, Bossi, Pasqualini, and others spoke on the other or "German" side, and advocated early emptying of the uterus.

Keit, of Leyden, draws attention to the fact that many cases of eclampsia get well whatever the treatment may be, and states that there is no direct evidence that forced delivery improves the prognosis. He does not rely on any one method of treatment, but considers that the systematic use of large doses of morphia administered subcutaneously seems to give the best results.

Byers, of Belfast, pointed out that the most probable hypothesis was that the convulsions were caused by a poison elaborated by the mother, or by the fœtus, which accumulated in the blood owing to some failure in the normal process of elimination. He advised the subcutaneous administration of morphia, the woman being kept upon her side, and all liquids by the mouth being withheld. Hot water or vapour baths, if obtainable, should be used. If labour has not begun, the convulsions should be treated with morphia, but the uterus should not be excited, and no attempt should be made to bring on labour. In the first stage of labour, when convulsions supervene, hydrostatic bags may be employed if the cervix is soft and dilatable; but if it is rigid, no local measures should be used. In the second stage of labour he advises delivery with forceps after the patient has been first anæsthetised.

Mangiagalli says that preventive therapeutics are very beneficial in removing the conditions which are the expression probably of the auto-intoxication, and consist in milk and intestinal disinfectants, diuretics, etc. The medical treatment (bleeding, purgation, morphine, chloral, chloroform, veratrum viride, or diaphoretics) is purely symptomatic, but is the only one possible in *post-partum* eclampsia, and in other conditions is a valuable aid to the obstetric intervention. Bleeding, followed by the subcutaneous or endovenous injection of normal saline solution, has much to recommend it, but it has not been employed sufficiently often to enable us to form a just estimate of its value. The speedy evacuation of the uterus constitutes the most important means of treating eclampsia. In *intra-partum* eclampsia it is a good rule to terminate labour when the conditions permit, and even to anticipate these by means of multiple incisions of the cervix. In eclampsia in pregnancy the induction of labour by rupture of the membranes is indicated along with the use of

morphine or chloral, or veratrum viride, in large doses. If these means fail, then forced dilatation of the cervix is to be preferred to the deep incisions of Dührssen. In some very bad cases even Cæsarian section may be a justifiable operation, especially if the fœtus be full-time and alive. Every operative intervention must take place with the patient deeply anæsthetised.

Ferré (*L'Obstétrique*, November 15, 1896), after a clinical review of the treatment of puerperal convulsions, insists that the milk treatment is most efficient from a prophylactic point of view, though it does not necessarily cause the other alarming symptoms besides the fits to vanish. He has never seen fits in a patient subjected for over a week to milk diet, nor any other trouble of a toxic origin. The alleged disappearance of albuminuria, on the other hand, does not necessarily occur. He speaks with equal decision on this point, declaring that he has never seen so much as an appreciable diminution of albumin, even after prolonged treatment by milk diet. Ferré says the same of œdema; this treatment seems to have no effect on it. He emphasises the above facts because he is aware how some obstetricians have very naturally given up milk diet on account of the persistence of albuminuria and œdema. Such a step is a mistake, for if the treatment be continued, labour will proceed without any fits coming on, though the legs remain swollen and the urine albuminous.

Halbertsma (*Nederlands Tijdschrift van Verlosk. en Gynaek.*, 1897, No. 2) gives an account of 109 cases of eclampsia, 49 being closely analysed. Of these latter, 31 suffered during pregnancy, and 18 at the beginning of labour. In 7 eclampsia set in before the eighth month of pregnancy—all mothers saved, but six children lost. In the case where the child was saved, incision of the os was undertaken. Of eclampsia later in pregnancy, Halbertsma classes 5 as "light" cases, 1 "moderately severe," and 17 as "heavy" cases. Out of the 17, 2 are rejected on account of some uncertainty as to the treatment, whilst in 7 neither Cæsarian section nor Dührssen's incision was practised, and all died; whilst in 8, where one or other of these procedures was adopted, 6 were saved.

Of the 18 cases beginning with labour, 6 are classified as "light," 12 as "severe," no less than three-quarters being lost. Of the 3 severe cases that were saved, in 2 incision of the cervix was practised, while in the third chloroform and morphine were administered, and when the os was completely dilated, forceps were applied. Halbertsma favours this last line of treatment, but states that, should it fail, the continuance of the fits will be more deadly to mother and child than Cæsarian section.

8. Dangers of membranous insertion of the cord.

Lefèvre (*Thèse de Paris*, 1896) has collected 151 cases where the cord lost itself on the membranes some distance from the edge of the placenta. This condition is most frequent in twin pregnancy. It exposes the fœtus to dangers during pregnancy as well as in labour. During gestation it may involve premature rupture of the membranes; in six cases at least no other reason could be found. Premature labour may be caused by membranous insertion of the cord, and Lefèvre believes that this anomaly of the funis explains certain cases of hydramnion and fœtal dropsy. In labour some cases of premature rupture of the membranes are due to membranous insertion, but it appears not to be so frequent a cause of that accident in labour as in pregnancy. It is also a predisposing cause of prolapse of the funis.

9. Peripheral neuritis connected with pregnancy and the puerperal state.

Reynolds (*Brit. Med. Journ.*, Oct. 16, 1897) writes that paralyses due to lesion in the nerve trunks may be divided into two classes: (1) those due to injury or disease of the nerve trunks as they pass through the pelvis; and (2) those due to neuritis occurring at the periphery of the nerves, and in which the nerves affected do not necessarily pass through the pelvic cavity. It is of this second variety that he deals more particularly. Relying upon the evidence of 49 cases which have been reported, Reynolds finds that the disease is more common in multiparæ. In 12 cases the onset occurred during pregnancy. Of the others, in 16 the symptoms appeared within the first week after delivery, in 7 during the second week, in 6 during the third and fourth weeks, in 2 within the second month; in the remaining 5 the time of onset is not mentioned. In 15 cases there was a distinct history of some form of sepsis, with shivering and fever; in 11 cases there was marked and incessant vomiting of pregnancy, and in 2 of these the symptoms of neuritis did not come on until about three weeks afterwards. In 4 of the cases there was a history of alcoholism, rendering the etiology of those cases doubtful.

Reynolds looks upon sepsis, or on incessant vomiting setting up a condition of acetonæmia, as the most potent factors in producing the neuritis, but it seems more probable that the vomiting, as well as the neuritis, is due to the toxin.

In 14 cases there was either no recovery or only a partial recovery, some of the most severely affected muscles remaining permanently paralysed. In 22 cases recovery was complete; while in 13 cases there is no mention of the termination. It

would seem that years may elapse before recovery takes place, so that treatment in some cases must be kept up for long periods.

10. Three normal pregnancies after nephrectomy.

E. Tridondani (*Ann. di Obstetricia e Ginecologia*, July, 1896) adds to the cases already recorded by **Schramm, Fritsch,** and **Israel** an interesting instance of the reproductive history of a woman who had had a kidney removed. A patient aged twenty-nine came into the Maternity at Pavia, suffering from symptoms resembling those of intestinal obstruction, accompanied by pain on micturition and scanty urine. She was in the eighth month of pregnancy, and to the left side of the uterus was a fluctuating tumour. Under treatment the woman improved and was spontaneously delivered of a male infant. Three months later the abdomen was opened and a cystic kidney removed: recovery was complete. Since then the patient has had three pregnancies. In none of the three were there any abnormal symptoms. The labours were at full term and natural. The infants were healthy and had a weight and size above the average. The author concludes, from the study of this and the three other reported cases, that pregnancy occurring in a woman with one kidney does not interfere with her health; that the progress of the pregnancy is not disturbed, and that the product of conception does not suffer. He does not, therefore, agree with Schramm, who advises a woman with a single kidney not to marry. It is noteworthy that in the above case the liquor amnii was increased in amount, but it is doubtful whether this was a consequence of the absence of one of the mother's kidneys.

11. Hyperemesis gravidarum.

At the 1897 meeting of the British Medical Association, held in Montreal, there was an interesting discussion on hyperemesis gravidarum. **Temple,** of Toronto, opened the discussion. He said it is generally admitted that the pernicious vomiting of pregnancy is more common in primæ gravidæ. He also believed that it is much more frequently fatal than some authorities stated. The ordinary morning sickness may be looked upon as physiological and purely sympathetic, but he believes, in the pernicious form, it is invariably accompanied by some pathological condition. Robert Barnes reports 9 fatal cases; Guéniot out of 110 cases reports 46 deaths; Howitż, 13 cases and 5 deaths; Joulin reports 121 cases and 49 deaths; McClintock reports 50 fatal cases; Doe, 48 cases and 18 deaths; while on the other hand Carl Braun, with an experience of 150,000 obstetrical cases, has never known a single fatal case of hyperemesis.

Of the theories regarding the etiology the large majority

ascribe the malady to reflex phenomena originating in conditions present in connection with the pregnant uterus, but the explanations are various.

Graily Hewitt laid great stress on flexions and versions in the growing uterus originating the peripheral impulses.

J. H. Bennett laid special stress on the inflammatory conditions of the cervix.

Howitz draws attention to the frequency of metritis and cellulitis.

F. Veit has drawn attention to the frequency of endometritis as a factor. Ebell agrees with Veit.

Bretonneau and others suggest that the peripheral irritation originates in the stretching of the fibres of the growing uterus, and stretching of the external and internal os has been practised with relief in certain cases.

Grandin suggests ovarian irritation as a cause, due to pressure on super-sensitive ovaries by the growing uterus. Disease of the gastro-intestinal canal is insisted on by other writers.

Hadra's toxic theory has many adherents.

Giles (London) said that among primiparæ there is a close and constant relation between sickness of pregnancy and previous dysmenorrhœa. Vomiting during the later months is frequently associated with hydramnion, twins, or an unusually large child. He has come to the conclusion that the vomiting is due to three factors: (1) exalted nervous tension, (2) a source of peripheral irritation, the enlarging uterus; (3) an easy outlet for this exalted tension—viz. the vagus. He could not agree with Horrocks that a *post-mortem* examination was necessary to establish the diagnosis of hyperemesis gravidarum, when patients going rapidly down hill recover completely on the termination of pregnancy.

Gardner (Montreal) had seen dilatation of the cervix relieve symptoms—in some cases promptly, in others within a few days.

Maury (Memphis), in his experience, had failed to find any pathological condition in the pelvis to explain the vomiting. When he found it necessary to induce labour he dilated the cervix and, after removal of the ovum by curette and forceps, tamponned the lower part of the uterus and the vagina. On the day following he completely cleansed the uterus with a dull curette.

Jewett (Brooklyn) found chloral and the bromides useful administered by the bowel. Locally he had found satisfaction in the use of cocaine, but of late had also dilated the cervix.

All the speakers agreed that operative interference must not be too long delayed.

A. Pozzi (*Archivio di Obstet. e Ginecol.*, May and June, 1897) has treated successfully 5 cases of severe vomiting in pregnancy by the method proposed by Professor Tibone. In 4 of these pregnancy had reached two and a half months, in 1 only one month and a half. The method referred to is the subcutaneous injection in the hypogastrium of a solution of hydrochlorate of cocaine (1 cg. to 1 g. of distilled water). In 2 of the cases treatment was begun in the second stage of the vomiting, when there was fever, and when cerebral phenomena had begun to manifest themselves. In 2 cases the cocaine was administered when the vomiting was still in the first stage, and in the fifth patient the author had to do rather with an exaggerated form of simple vomiting than with the grave incoercible type. In all the cases a great number of other means of treatment—including in some replacement of the uterus—had been previously tried.

12. Spurious abortion.

Eden (*Lancet*, Sept. 25, 1897) gives an account of three cases of spurious abortion. It is an account of a class of cases in which a mimicry of early pregnancy and of abortion occurred, quite different in its characters from the condition known as spurious pregnancy. They were not associated with hysteria, and the usual functional disturbances of pregnancy were not exaggerated. They differed from pseudocyesis in the existence of definite changes in the uterus, and from pregnancy, topic or ectopic, in the essential point of the absence of an ovum either within or without the uterus. They mimicked abortion in the occurrence of amenorrhœa with enlargement of the uterus, and the formation within it of a body the detachment and expulsion of which were followed by a return to menstrual regularity. The body expelled was not an ovum, but was formed entirely from maternal structures. Three cases only have been recorded, and Eden gives an account of each of the specimens. In each case there was the same history of amenorrhœa and morning sickness, terminating after eleven weeks in hæmorrhage and the discharge of a fleshy mass, presenting certain points of resemblance to the decidua of pregnancy, with certain well-marked points of difference; in all of them the microscope alone did not suffice to distinguish these casts from those often met with in extra-uterine pregnancy.

Eden would formulate the condition as follows: "The development within the uterus, in the absence of uterine or extra-uterine gestation, of a membrane having the essential characters of the decidua of pregnancy and accompanied by the signs of early

pregnancy; and its separation and expulsion from the uterus with hæmorrhage, thus simulating abortion."

Diagnosis was impossible until after the discharge of the cast; it then consisted of two distinct steps: (1) The exclusion of uterine pregnancy by careful microscopic examination of the cast, which demonstrated the absence of chorionic tissues; and (2) the exclusion of extra-uterine pregnancy. In two of the three cases this was possible by the direct inspection of the tubes and ovaries, as in each case abdominal section was performed under the impression that the case was one of extra-uterine gestation.

Two explanations of the condition were possible: (1) That an ovum was actually fertilised, but perished at a very early period without leaving traces of its presence, while the "genetic reaction" in the uterus and in the general organism progressed as in pregnancy; and (2) that some stimulus other than the presence of a fertilised ovum in the genital tract might lead to the formation within the uterus of a complete decidua, and might hold the menstrual functions in abeyance. Provisionally, Eden adopts the first explanation.

13. The use of injections of saline fluid in cases of severe uterine hæmorrhage after delivery or during pregnancy.

Olivier (*Journ. de Méd. de Paris*, March 28, 1897) asserts that injection of saline fluid has a distinct hæmostatic action, and quotes Hayem in support of this view. The same authority states that of all the fluids used the least harmful is one containing chloride of sodium in the proportion of 10 in 1,000 parts of water. In cases where the hæmorrhage has been severe, Olivier thinks it best to inject large quantities of this fluid directly into the veins, but in less urgent cases injection into the loose cellular tissue will suffice. He insists on the importance of the water used being properly sterilised, and suggests that a supply of sterile salt solution should be carried by the accoucheur, together with the necessary apparatus. Although the amount of fluid carried may be insufficient, it will be enough to tide over the patient till a further supply be prepared. The only contra-indication to the use of large venous injections of saline fluid is renal disease. In such cases, if used at all, only small quantities should be injected.

14. Diagnosis and treatment of rupture of the uterus.

H. Ludwig records (*Wien. klin. Woch.*, 1897, Nos. 11, 12) nine cases of rupture of the uterus. In the first the rupture occurred during the extraction of the decapitated breech; the head was subse-

quently removed by laparotomy. In the second the rupture was diagnosed before delivery and Cæsarian section performed. In the third a rupture arose during version; the child was extracted, and the after-coming head perforated. The fourth was a case of craniotomy, which terminated the labour, after which the rupture was discovered. In the fifth, also, craniotomy was performed, the rupture not being diagnosed with certainty before birth. In the sixth there was again uncertainty; delivery was effected after decapitation. The last three were all diagnosed; they were delivered by craniotomy, perforation, and cutting through the cervical vertebræ respectively. With regard to diagnosis, Ludwig insists on the valuelessness of individual symptoms, such as collapse, bleeding, sudden and severe pain, recession of the formerly fixed presenting part, cessation of pains, etc. He has found the best diagnostic signs to be: (1) in lateral rupture the interruption of the natural contour of the uterine quadrant, either a projection or a nodule being formed; (2) abnormal mobility of the uterus; and (3) emphysematous crackling at the seat of rupture. If the head presents and can be pushed back, bimanual examination under deep narcosis should lead to a certain diagnosis.

With regard to treatment, delivery may be effected *per vias naturales*, or by laparotomy. The former is indicated when a large part of the child is already fixed in the pelvis, and also when the diagnosis of uterine rupture cannot be made before delivery. In cases in which the child remains in the uterus after the rupture, or has only partly passed into the abdominal cavity, delivery *per vaginam* is only to be preferred when it can be carried out without losing time or increasing or complicating the tear—for instance, in head presentations and the absence of contraction of the pelvis, also where a rupture takes place during an operation. Laparotomy is indicated when the whole child has passed into the abdominal cavity, when the passages are not fully dilated, in contracted pelves, in severe hæmorrhages, and in injuries to the neighbouring organs. In partial passage of the child into the abdomen, or with a living child still in the uterus, Cæsarian section is the correct procedure when natural delivery would take too long, and be fraught with danger to the mother. As regards treatment after delivery, of Ludwig's 9 cases, 3 came into the hospital and were operated on—2 by supravaginal amputation and 1 by abdominal hysterectomy; all 3 recovered. The remaining 6 were treated outside: 5 were operated on—4 by supravaginal amputation, 1 by abdominal hysterectomy, of which 1 recovered and 4 died of sepsis. There was no death from

hæmorrhage, except in the remaining case, which was not subjected to operative interference.

Cullingworth (*Lancet*, Sept. 26, 1896) reports two cases of rupture of the uterus. In the first case, before delivery, a rent 3 inches in extent in the posterior vaginal wall was discovered, through which the intestines could be felt; the posterior wall of the uterus was very thin. It was a breech presentation. Labour was completed under chloroform by bringing down the half breech and extracting. The rent was then found to extend upwards, and was 10 inches in length. After removal to the hospital the rent was sewn up for 6 inches; the remainder, about 4 inches, being out of reach, the vagina was plugged. The patient recovered completely. In the second the patient died before delivery and before any treatment could be applied; it was found that the uterus, which at its lower part was only $\frac{1}{8}$ inch in thickness, was ruptured for a length of 6 inches into the left broad ligament. In both these cases the rupture occurred in the lower part, and in the second case the part in which the rent was placed was the thinnest of the whole uterine wall; while in the first, examination showed great thinning of the uterus before the laceration had extended into it. This is to be noted, because Dr. Blind, from twenty-four cases, states that the rupture is always at the fundus. In neither case was there any evident obstruction at the outlet.

Cullingworth quotes the statistics of Merz. He gives a list of 230 cases; of these 94 were untreated, 54 were subjected to abdominal section, and the rest treated in various ways. Of the untreated cases, 70 had complete rupture, of which 10 recovered, and 21 incomplete rupture, of which 4 recovered; 3 were doubtful cases, and all died. The treatment varied considerably. Compression of the abdomen by bandage was employed in 5 cases, with 3 recoveries. Intra-uterine tampons were inserted in 25 cases; 9 of these patients recovered. Tube drainage in 19 cases gave 12 recoveries. Drainage by an iodised skein of thread in 8 cases gave 7 recoveries. Drainage, washing out, and irrigation was the treatment in 7 cases; 5 recovered. Suture of the rent after abdominal section in 24 cases gave 10 recoveries; without suture in 15 cases gave 8 recoveries; with amputation of the uterus in 15 cases gave 8 recoveries.

15. Nervous diarrhœa in pregnancy.

Condio (*Centralbl. f. Gynäk.*, No. 29, 1897) has published a monograph on an interesting complication which he considers to be related to hyperemesis gravidarum. Whilst the latter is more frequent in the higher ranks of life, diarrhœa seems commoner amongst poor pregnant women. Obstetricians note its occurrence

in lying-in hospitals in cities where it is hardly ever seen in private practice. Out of 3,674 pregnant women in the Turin Maternity, nervous diarrhœa was observed in 35. No fewer than 21 of these cases occurred in primiparæ. Temperature has little influence on this affection, but errors of diet are more probably among its causes. Nervous diarrhœa begins about the fifth month, and may become formidable; it has been found to continue even in child-bed. Nerve tonics are indicated, and, as in hyperemesis, premature labour must be induced if the diarrhœa persists and the patient becomes seriously debilitated.

16. Etiology of mastitis.

Rudolf Köstlin (*Arch. f. Gynäk.*, Bd. liii., Hft. 2, 1897) discusses the question of the relation between the germs contained in human milk and the production of mastitis. He has investigated bacteriologically the milk from the breasts of 100 pregnant women, of 137 in the puerperium, and of 60 children. Micro-organisms were found in the milk in these groups of cases in the proportion of 86, 91, and 75 per cent. With few exceptions these were of the nature of staphylococci, and especially the staphylococcus albus. The immigration of bacteria takes place from the outside from the mammary areola; their entrance along the line of the blood current has not yet been satisfactorily established. The entering germs are relatively innocuous; they injure neither the mother nor the infant; mastitis without micro-organisms does not occur. The infection in mastitis takes place from the outside, along the line of lymphatic vessels, from injuries in the skin. The result is the development either of the ordinary form of mastitis due to the invasion of staphylococci, especially the staphylococcus aureus, or of the much rarer form of pseudo-erysipelas and of retro-mammary abscesses caused by streptococci. These conclusions are supported by bacteriological, clinical, and pathologico-anatomical evidence. Mixed infections are, of course, quite possible. A metastatic mastitis developed along the line of the blood current has not yet been certainly established.

17. Paralysis of child's arm after delivery by feet.

Guillemot (*Annales de Gynéc. et d'Obstét.*, January, 1897) publishes a report of a large number of cases of paralysis of the arm, where all the infants were extracted by the feet and all by the same midwife. Prouff, of Morlaix, detected nearly 30 of these cases, Guillemot publishing clinical notes on 12 out of the same series. Most of the patients were about twenty years old, for the cases have been most carefully watched. In many the shoulder-joint, elbow-joint, or wrist was the seat of the disease—not neuropathic, but, like the nerve lesion, caused by damage

during delivery. The midwife must have pulled with great force and irregularity, knowing nothing about axes. Guillemot suspects that she in several instances turned, probably when quite unnecessary, and extracted before complete dilatation of the os. He gives reasons to show that the paralysis was not due to myelitis. Torticollis was present in some cases, but Guillemot admits that it might be a complication caused by laceration of the sterno-mastoid muscle and hæmatoma, or by articular disease in the cervical spine. In nearly all, the scapula on the affected side was elevated, indicating paralysis of the lower part of the trapezius. The branch of the cervical plexus which supplies this part must manifestly be stretched by the great depression of the shoulder caused by firm and long traction on the arm. These tractions appear to damage the fifth and sixth cervical nerves most severely, judging from the lesions seen in the arm. When the cervical spine is torn through or the head torn off in delivery, the separation occurs at the level of the third, fourth, and fifth cervical vertebræ. Thus at this level the tissues are least resistant and allow of the greatest amount of traction. In these cases sensation is usually preserved more or less, for during these violent and clumsy tractions on the arm the head is deflected and the neck forms a concavity backwards, so that the posterior and sensory roots of the cervical nerves suffer the least traction.

Fieux (*ibid.*) publishes an independent communication on the pathogeny of paralyses of the arm in newly-born children. In this paper valuable neurological observations will be found. Fieux directs attention to the law of Forgues, of Montpellier, that when a group of muscles receive their nerves from a plexus, the highest muscles are supplied from the highest filaments in the plexus. The deltoid, according to that law, should be supplied from the highest filaments of the brachial plexus. The highest cords of that plexus suffer most from the traction on the arm during delivery, and therefore it is not surprising, in Fieux's opinion, that the deltoid is the most gravely affected of all the muscles in obstetric paralysis.

18. Labour complicated by abnormalities of the cervix uteri and vagina.

John Campbell, at the annual meeting of the British Medical Association (*Brit. Med. Journ.*, Oct. 23, 1897), drew attention to these serious, if rare, complications of child-birth. (1) Atresia of the cervix may occur in primiparæ or multiparæ. In all cases it is due to inflammation of the cervix, which, in the early stages of pregnancy, leads to adhesion of the granulating surfaces of the

lower end of the cervical canal. As labour advances the cervix descends and appears at the vulva, or even protrudes beyond, as a dark-red, thick-walled, fluctuating tumour, becoming tense at every pain. The os is concealed by the perinæum, and is to be sought for on the posterior aspect of the presenting mass.

Pains of great force and frequency are present in these cases, and there is considerable risk of injury to the uterus. The first thing is to determine exactly, by palpation or inspection, the site of the occluded os, if necessary drawing the cervix forward or to one or other side with a volsella. When this is found, scratching with the finger-nail is all that is required to define its margin. The membranes can then be seen, but are usually very adherent to the margin of the os, and must be separated by steadying the cervix with the volsella and sweeping the finger round. Dilatation will be continued by the membranes, puncture, incision, or the use of dilators being very seldom required.

(2) Septa in the vagina. (*a*) Strong transverse septa are occasionally found, usually having a central aperture requiring dilatation or incision. (*b*) Longitudinal septa are more common. These septa can hardly interfere with the progress of labour, but are important to the obstetrician, because they may puzzle him when making examination.

(3) Abnormalities of the hymen as a rule cause no serious obstacle to delivery, but may lead to difficulties in diagnosis, and to a certain amount of harm to the patient. Examination should be carefully made; dilatation with the finger is all that is required.

19. The influence of suspensio uteri on pregnancy and labour.

There is an important and interesting paper on this subject in the August number of the American *Journal of Obstetrics* by **C. P. Noble**, of Philadelphia. He relates two cases in his own practice in which suspensio uteri had been performed, and the uterus firmly fixed to the anterior abdominal wall by buried silk-worm-gut sutures, in which pregnancy subsequently occurred. In Case 1, when labour came on, the pains continued for several hours without effect. On examination a tumour was felt resembling a uterine fibroid resting above the symphysis, and causing a serious obstruction at the pelvic inlet. The sutures used could be distinctly felt through the abdominal wall at the upper margin of the mass. No presentation was felt through the cervix. In a more thorough examination it was found that the posterior wall of the uterus was extremely thin, and almost the whole cavity in which the child lay was bounded by the posterior wall. The

breech lay just above the upper limit of the obstructing mass, and the child's head was high up on the left; the feet and legs lay to the front. Cephalic version was performed, and delivery was effected by a very high application of Tarnier's forceps. The umbilical cord had been compressed between the mass of muscle above the symphysis and the child's head, and the child was stillborn. The mother made a good recovery. In Case 2 the membranes were ruptured at the beginning of labour. The cervix uteri could not be felt on ordinary vaginal examination, and the anterior lip could only be reached when half the hand was introduced into the vagina. Under an anæsthetic the os was found to be very high up opposite the sacral prominence, and undilated. A large tumour, which was evidently the hypertrophied fundus and anterior abdominal wall held down by the sutures, obstructed the inlet of the pelvis, and on this mass the breech rested. It was impossible to get the feet down, and delivery was effected by Porro's operation. The patient died afterwards from septicæmia. Noble has collected 808 American cases of ventrifixation in which at least one ovary was left. Among these there have been 56 pregnancies. Six ended in abortion, and 7 were not delivered at the time of writing. Among the remaining 43 cases in which labour occurred at or near full term there were 3 deaths, in only one of which cases Noble considered the operation had any influence, and the mortality therefore traceable to it is about 2 per cent.

His conclusions are: (1) That women subjected to ventrifixation are less likely to become pregnant than other women; (2) that pregnancy and labour are generally uncomplicated; (3) that inertia uteri is not unfrequently met with; and (4) that serious or insuperable obstruction to labour may be produced if the fundus and anterior wall of the uterus are fixed below the point where the uterus has been attached to the abdominal wall. He believes that the sutures should be passed through the anterior aspect of the fundus, and not too deeply into the uterine wall, and that as regards the abdominal wall they should only include the peritoneum.

Noble alludes to the difficulties in delivery which he has met with after vaginal fixation of the uterus, and states that in cases where pregnancy follows the operation, abortion has occurred in 25 per cent. He considers that from an obstetrical standpoint the results have been disastrous, but he gives no statistics. His results do not agree with other authorities as to the relative value of the two operations.

Grusdew (*Münch. med. Woch.*, Nov. 17, 1896) gives an account

of the results of vaginal fixation as performed at the hospital for women in Riel. In 4 cases pregnancy occurred—1 aborted, and 3 were delivered of living children. In one of these cases the child presented by the shoulder, but in the other two spontaneous delivery took place without any difficulty.

20. Post-partum hæmorrhage.

Lombe Atthill (*Brit. Med. Journ.*, March 6, 1897) makes some observations on the Anticipation of *Post-partum* Hæmorrhage. As the result of his experience of the administration of ergot, or, as was usually given, ergot in combination with strychnine, for not less than three weeks prior to labour, he comes to the following conclusions: (1) That when administered previous to the termination of pregnancy in women in whom a tendency to *post-partum* hæmorrhage is known to exist, ergot in combination with strychnine tends in a marked manner to prevent the occurrence of hæmorrhage. (2) That when so administered in ordinary doses, it does not produce any injurious effect on either mother or child, and that its exhibition seems to delay the commencement of labour in such a case. (3) It tends to make the involution of the uterus more perfect, and lessens the chance of the occurrence of subsequent uterine troubles, many of which depend for their cause on imperfect involution of that organ. (4) It will not bring on premature labour or induce abortion unless uterine action has previously been set going. (5) In cases of threatened abortion its administration frequently seems to act as a uterine tonic, and in some cases tends to avert the danger of a miscarriage, provided the ovum be not blighted. (6) That if the ovum be blighted, and especially if it be detached, ergot usually hastens its expulsion.

It was the unexpected immunity from *post-partum* hæmorrhage in a patient to whom he had administered quinine for neuralgia prior to labour that induced Dr. Atthill to carry out the preventive treatment he advocates, and it was quinine that he first administered for this purpose.

III.—EXTRA-UTERINE FŒTATION.

1. Simultaneous ovarian and uterine pregnancy.

H. Ludwig, of Chrobak's clinic (*Wien. klin. Woch.*, July 2, 1896), records a case exceptional in its nature and unique in its event. The patient, aged thirty-five, had previously been delivered at term of five healthy children. She became pregnant for the sixth time in April, 1895, and complained, from the third month, of considerable pain in the abdomen, which increased during the second half of gestation, and was accompanied by unusually

vigorous fœtal movements. On February 20, 1896, she was delivered naturally of a mature and healthy girl. The midwife discovered that another child remained, and called a doctor; both he and another medical man waited for the second birth, which they expected to be natural. As this did not occur, they gave the patient the choice of waiting till the death of the fœtus and then undergoing laparotomy, or of being operated on at once. She came to no definite decision, but went on perfectly well for four days, the movements of the child being still vigorous. On the fifth day she made up her mind to go to Vienna for an operation, and arrived there after a seventeen-hours' journey. On examination a living child could be felt in the abdomen. The normal puerperal uterus was about the size of a man's fist, and the appendages on the right side were natural, but on the left side a short thick cord could be felt, extending into a tumour, filling up the left iliac fossa. *Per vaginam* this tumour could be felt pressing down into Douglas's pouch, and the child's head could be made out entering the pelvis; the lochia were normal. The diagnosis of a left extra-uterine gestation with a living mature child having been made, laparotomy was immediately performed. The ovum was found attached to the left side of the uterus, from which the placenta appeared to grow. The vascular relations were so intimate that the idea of removing the gestation sac and sparing the uterus was at once abandoned. The sac was therefore opened and a healthy, well-developed boy extracted, who began at once to scream lustily; the cord having been tied, the uterus and appendages were removed. The stump was treated extra-peritoneally. The recovery was somewhat delayed by a right-sided pneumonia, but the mother and child left the hospital well on March 22. The specimen removed consisted of the uterus and the appendages of the right side, which were normal, and those of the left, which were converted into the sac of the ovum. The left tube could be distinctly traced into a tubo-ovarian ligament about half an inch broad, while the ovarian ligament proper was seen to lose itself in the upper part of the sac; from the free end of the tube an ovarian fimbria led into the sac, of which the outer layers appeared to be formed by the remains of the ovary. The sac itself consisted of two parts, one of which, closely attached to the side of the uterus, was solid, while the other, situated more externally, was membranous and had contained the ovum. The former consisted mainly of a normal placenta, into which two large vessels, artery and vein, ran from the uterus; the latter corresponded in its relations to a greatly enlarged ovary, and showed on its surface a number of cystic protrusions, which were

obviously ovarian follicles. Microscopical examination revealed the presence of a layer of ovarian tissue covering the whole of the membranous portion of the sac; the placental tissue was normal in structure. The essential points in the pathological diagnosis of ovarian pregnancy have been laid down by Veit as complete presence of both tubes and one ovary, the other ovary either being absent or forming part of the sac wall, while at the same time one ovarian ligament must open into the sac. All these requirements are satisfied by this case, and the diagnosis is clinched by the microscope. Ludwig gives a full bibliography and a classified table of results, from which it appears that this case is the first of its kind which resulted favourably both to the mother and to two healthy children.

2. Extra-peritoneal incision.

Berry Hart, at a meeting of the Edinburgh Obstetrical Society on March 10, 1897, read a paper on the Extra-peritoneal Incision in Extra-uterine Gestation, Intact and at Mid-term. While the conditions of an extra-uterine gestation may be very varied, there are practically three possibilities in intact forms. In the first two months the gestation is in the Fallopian tube, and intact or ruptured. At the third month it begins to develop between the layers of the broad ligament and lose its pediculated characteristic. In the fourth and fifth months it is usually embedded in the pelvic connective tissue and the broad ligament, and may go on developing extra-peritoneally; but, as a rule, the fœtus escapes into the peritoneal cavity, and the placenta remains extra-peritoneal or tubal. He specially referred to the second variety, having operated on five such cases. The first case had ruptured before operation, and the patient died subsequently; the others recovered. The treatment should be wholly operative. In this class of case—mid-term and intact—the gestation is extra-peritoneal; the possibility of its being an ovarian pregnancy is most remote, and primary intra-peritoneal gestation is a myth. Hart advocates extra-peritoneal incision where possible, immediate removal of the fœtus, and, to avoid bleeding, the tamponnade of the sac till the placenta be thrombosed, if it cannot be easily separated. He thinks it better to open the abdomen in the middle-line first, and thus to find the relations of the gestation and the reflections of the peritoneum. The vaginal route for operation is more difficult if the fœtus and placenta are present, and control of hæmorrhage is very difficult, as the tampon cannot be so effectively applied.

3. Operation for full term ventral pregnancy.

John W. Taylor, at the Obstetrical Society of London, May 5,

1897, read a paper on "A Second Case illustrating the Treatment of (so-called) Abdominal or Ventral Pregnancy at Full Term by the Operative Removal of Child and Placenta; Operation at the Twelfth Month; Recovery." The patient believed she became pregnant twelve months before the operation. Except for an attack of hæmatemesis she was up and about the whole time. At no period was there any acute pain, sudden illness or fainting. A description was given of the operation. The placenta was of the ordinary size, and covered the pelvic inlet "like the lid of a saucepan incompletely closed," the edge of the placenta being exposed and free on the left side of the pelvis, but closely applied to the abdominal wall on the right side, where the cord was situated. Its attachments were, first, a thick band or rope of omentum firmly attached to the upper or serous edge of a placenta on the left side; secondly, several thin attachments or adhesions of small intestine and cæcum to the same surface; thirdly, the deep pelvic attachments of the under surface of the placenta. The author described his bloodless method of removing the placenta. He said that the attachments were very vascular, and that the vessels could be felt pulsating before the forceps were applied. The main point, however, was that as each vascular connection was controlled before separation, the same operation might have been performed at any previous period of the pregnancy; and it might have been possible to save the child as well as the mother if the patient had come to the hospital at the time of the supposed labour. He said that he would always prefer to operate at term, and under no circumstances would he purposely wait for the death of the child before opening the abdomen.

IV.—OPERATIVE DELIVERY.

"The Relative Advantages of Forceps and Version as a Means of Extraction in Cases of Moderate Pelvic Deformity" was the subject of a discussion opened at the meeting of the British Medical Association, 1896 (*Brit. Med. Journ.*, Oct. 31, 1896), by **Milne Murray.** He points out that obvious advantages to the mother of delivery by forceps are: (1) avoidance of risk of uterine rupture; (2) avoidance of intra-uterine manipulation; (3) diminished risk of infection; and to the fœtus: (1) avoidance of traction on the neck; (2) avoidance of compression of the cord. The group of cases in which version competes with forceps is that occurring in flat pelvis, where delay is due to shortness of the conjugate diameter, and in which the transverse is in no degree, or only to a small extent, diminished. In cases of the justo-minor type

the question of turning cannot arise. Experience has certainly shown that the use of ordinary forceps in cases of minor degrees of pelvic flatness was associated either with failure in delivery, or else delivery was accomplished by the expenditure of enormous force, generally resulting in a dead child and lacerated maternal passages. By version a living child is often obtained with the expenditure of comparatively little force. Authorities explain this disadvantage of forceps thus:—(*a*) The forceps must be applied to the antero-posterior diameter of the fœtal head; (*b*) this grasp of the head is associated with a bulging of the transverse diameter; (*c*) that by version, on the other hand, a shorter diameter than the bi-parietal is introduced into the conjugate at the brim; and (*d*) that when the head is dragged through, base first, the bi-parietal diameter is compressed.

Milne Murray, however, denies that the forceps causes the bi-parietal diameter to bulge. He has shown that it is possible to compress the occipito-frontal diameter to the extent of $1\frac{1}{2}$ inches without producing the slightest increase in the bi-parietal diameter, the expansion being a vertical and not a transverse one. This is explained by the cranial shell being made up of three segments—frontal, parietal, and occipital—and the effect of antero-posterior compression is to force the occipital and frontal bones under the edges of the parietals. The difficulty of forceps extraction is caused, he thinks, by the exaggeration of the mechanical defects of the ordinary forceps as a tractor when applied in flat pelves, the axis of the brim being inclined farther backward and so making it practically impossible for traction to be employed in that axis, and rendering the effective force of the traction less and less. The solution of the problem of economising the force used is in a great measure found in the axis-traction forceps of Tarnier; but Milne Murray has introduced a most important modification of the instrument which will permit the line of traction to be altered to suit any given case of pelvic deformity, the ordinary axis-traction forceps only allowing traction to be made in the pelvic axis when the pelvis is normal. In his instrument the traction rods run down the back of the handles, and at a point half way down turn backwards at a right angle, forming two horizontal bars with graduations $\frac{1}{2}$ inch apart. Against one of these marks is placed the word "normal," and when the movable handle is adjusted to it the instrument is for use in a normal pelvis. To adapt it to a pelvis whose axis is inclined less than normal it is only necessary to shift the handle one or more divisions nearer the application handles, and *vice versâ* when the axial inclination is greater than normal.

The advantages claimed for the use of the axis-traction forceps in flat pelves are: (1) the forceps can be applied without difficulty to the antero-posterior diameter of the head, and in the transverse or roomy diameter of the pelvis; (2) the grasp of the head does not materially compress it; (3) no amount of practicable compression of the head in this direction is capable of causing the least expansion of the bi-parietal diameter; (4) the mode of grasp favours the development of the Naegele obliquity, and this follows the natural mechanism of delivery in these cases; (5) as compared with version, forceps avoids intra-uterine manipulation.

V.—THE PUERPERAL STATE.

1. Disturbance of lactation.

Angel Money (*Australasian Med. Gaz.*, Jan. 20, 1897) says that the custom of weaning newly born children is too prevalent, and too few attempts are made to correct the milk when at fault. A thorough investigation of mother and milk should be made, and the quantity and quality of the latter determined, and the percentage of fat and proteid, which are the only variable factors, ascertained. Bad milk contains toxic matters, albumoses, and leucomaines, albumin being plentiful, but of the wrong kind, while the percentage of fat is deficient; colostrum corpuscles are present and may be numerous. The most successful milk is that of mothers desirous, and confident of ability, to nurse. Exercise can diminish percentage of proteids, and a moderate amount of beef or mutton can increase percentage of fats; these facts are seldom acted upon. A poor milk may be enriched by improving the maternal dietary, giving more meat and more milk, diminishing exercise, shortening intervals of nursing, and diminishing amount of liquids imbibed. Rich milk may be diluted by lengthening intervals of nursing, decreasing the amount of meat eaten, increasing exercise, augmenting fluid drunk; drinking distilled water, Helidon or Vichy water, midway between the nursings is an excellent practice. Colostrum corpuscles present after the first fortnight signify defective formation of milk. It is unjustifiable to diminish the water in poor milk by purgation, which may stop milk flow or may even cause the milk to contain toxic substances. The breast pump is not sufficiently used to improve the function of lactation; it should replace the baby while attempts are being made to improve the milk. The more perfectly formed the milk is, the more caseinogen and less albumin it contains; however great the percentage of caseinogen, it never in the stomach forms dense clots as formed by cow's milk. It is a

mistake to suppose that stout or porter improves milk. Another error is the belief that beef-tea and chicken broth are good for nursing mothers. Excitement, fatigue, and overfeeding should be avoided; also highly spiced, rich, or stimulating foods. The bowels should be regulated by proper dieting and massage or exercise rather than by laxatives, and it is highly desirable that there should be at night uninterrupted sleep for six hours for mother and child.

2. Puerperal biliary colic.

Eiermann (*Münch. med. Woch.*, Jan. 12, 1897) says that the records of cases of biliary colic occurring after labour are few. He relates the case of a primipara who suffered from albuminuria during pregnancy and who had an attack of biliary colic five days after delivery. There had been no previous history of gall-stones. **Gottschalk** has seen nine or ten cases in ten years. In one case the colic reappeared after a subsequent pregnancy, the patient having been free from it in the meantime. **Praus** has stated that the first attack of colic occurs in a large number of cases during pregnancy or after parturition.

3. Puerperal fever. (The use of antistreptococcic serum in the treatment of puerperal fever.)

John D. Williams (*Brit. Med. Journ.*, Oct. 31, 1896) reports 6 cases with 5 recoveries, and notes 8 cases collected from literature. On 10 of them which were fully reported he makes the following remarks:

(*a*) *Nature of the cases.*—In every case a previous thorough trial had been made of the usual constitutional and local remedies. The state of the pelvic organs was ascertained in 9 cases, and, with two exceptions, where there was uterine tenderness, were apparently normal. The cases were characterised by severe febrile symptoms, and in some there were diarrhœa and vomiting. In 2 cases only was bacteriological confirmation of streptococci obtained.

(*b*) *General effect of the serum.*—Following each injection, the previously hot, dry, and inactive skin passed into a state of moisture and active perspiration, the parched lips and dry tongue became moistened, and other distressing symptoms were relieved. In three cases, however, no benefit resulted from the treatment.

(*c*) *Effect on temperature and pulse.*—In all the cases except the three just mentioned the degree of temperature and the frequency of pulse were reduced after each dose of the serum. This reduction took place in from six to twenty-four hours.

(*d*) *Complications and fatalities.*—Two of the cases proved fatal.

(*e*) *Mode of administration.*—The serum was injected into the areolar tissue of the abdominal wall.

(*f*) *Dosage.*—The largest dose administered was 45 c.c. (Ruffer's). Better results were found after a large than after a small initial dose. The Brit. Inst. of Preventive Medicine fixes the initial dose at 20 c.cm., but Bullock states that much larger doses can be given with safety.

Haultain (*Lancet*, June 26, 1897), at the Edinburgh Obstetrical Society, gives a detailed account of three cases. In the first, symptoms began late—on the 26th day, being the first on which any severe symptoms appeared. A culture then showed typical Loeffler bacilli, and the patient was treated with antidiphtheria serum with very marked success. In the second case, the onset was forty-eight hours after delivery, and bacteriological examination showed a growth of streptococcus and bacillus coli. The patient died a week afterwards, and apparently she derived no benefit from the antistreptococcic serum. In the third case, the onset of symptoms was on the third day, and a culture showed many streptococci. Antistreptococcic serum was injected on the ninth day. Haultain says that the three cases showed three distinct varieties of infection: (1) an intra-uterine diphtheria, probably localised to the placental site, giving rise to a dangerous state without external evidence of its true character, or evidence deducible from ordinary clinical signs. The second was a mixed infection, and showed the virulence of the bacillus coli communis, and the absolute inefficacy of the antistreptococcic serum in these cases. The third case was of less value, since it was probably a simple toxin poisoning or sapræmia such as generally yields to antiseptic uterine douching. It must be noted, however, that improvement only set in after the douching was combined with the serum treatment. The culture method was the most effective diagnostic yet advanced. Even the microscope gave no idea of the vitality or virulence of the organism. In Case 3, for example, streptococci were found in the discharge after the disappearance of symptoms. Probably they were then either dead or so crippled as to be innocuous. It was to be hoped that the close observation of a number of cases would lead to the association of clinical symptoms with each variety of infection. Diarrhœa and erythematous patches seemed more or less characteristic of infection with bacillus coli communis. From a prognostic point of view the culture method was invaluable, because the prognosis varied greatly, according to the organisms present. Thus **Marmorek** has shown that of 15 cases of puerperal fever in which the serum method was employed, 7 were due to pure

streptococcus infection, and these all recovered; 5 were due to a mixed infection of streptococcus and staphylococcus, of which 2 died; 3 cases were due to a mixed infection of streptococcus and bacillus coli communis, and all died. The prognosis is distinctly more favourable when the case is one of simple streptococcus infection. All other methods should be used conjointly with the serum treatment. Packing with gauze soaked in antitoxin seemed worthy of trial, since the serum was said to be bactericidal as well as antitoxic. Haultain's method of obtaining cultures is to pass a Fergusson's speculum and expose the os. A platinum wire, previously rendered aseptic by heating in a flame, is passed into the cervical canal and some discharge obtained on it. This is then dipped into agar in a prepared test tube, the tube at the time being held bottom upwards to prevent dust and germs from falling into it. A plug is then inserted and the tube sent to the laboratory.

Several isolated cases have been reported in the medical journals. **Edmunds** (*American Journ. Med. Sci.*, April, 1897) records a case in which no other treatment was adopted, and which was shown, by the examination of pus from an abscess near the knee, to be a case of genuine streptococcus infection. The patient made a complete recovery, which Edmunds thinks was entirely due to the antitoxin. **Cummins** (*Brit. Med. Journ.*, Feb. 13, 1897) had a case admitted under his care on the ninth day after her confinement, who on the sixteenth day, with a pulse of 132, rigors, and a very high temperature, was apparently sinking. There were constant vomiting, hiccough, and involuntary evacuations. Under the influence of the serum injections the general symptoms disappeared rapidly, but the temperature continued high for some days.

Steele (*Brit. Med. Journ.*, Oct. 2, 1897) gives a table of the cases reported in 1896. Those cases in which the serum was injected soon after the onset of symptoms appear to have done best. When the treatment has been delayed convalescence has been more protracted. The earlier the onset the more severe were the symptoms, and in all the fatal cases the symptoms began early.

In a recent work by **Pinard** and **Wallich** (Paris, 1896) the subject of the treatment of puerperal infection has been very fully dealt with. They emphasise the importance of beginning treatment early, and state that, if the temperature reaches 102° F., whether the pulse be above or below 100, an intra-uterine douche should be given. If the temperature does not fall to normal, or if the pulse remains above 100 although the temperature has

gone down, the douche must be repeated. If, in spite of treatment, the temperature remains high, and the patient has been delivered three or more days, curettage is advised. If, in spite of curettage followed by intra-uterine douches, the temperature still continues to rise and a second curettage is not successful in reducing it, continuous uterine irrigation should be employed. The fluid used for the first half-hour is biniodide of mercury 1 in 4,000, and then this is replaced by a 1 per cent. solution of carbolic acid. Later a still more dilute solution may be used. If relief is not obtained in from twenty-four to forty-eight hours, the irrigation may be discontinued. Pinard considers it dangerous to use a curette on the first or second day of the puerperium, and advises that, if an intra-uterine douche does not lead to a speedy fall in temperature, continuous irrigation should be resorted to.

VI.—MECHANISM OF DELIVERY.

1. Breech presentation with extended legs was the subject of a paper read by **Griffith** and **Lea** at the Obstetrical Society of London on January 6, 1897. This paper was based on seventeen cases, which were briefly described, and the following conclusions were arrived at :—(1) The extension of the legs in incomplete breech presentations may be either primary or secondary. (2) In the primary variety, which occurs before labour has begun, the breech engages readily in the brim, and the diagnosis can be made. (3) In the secondary variety the extension occurs during labour. This form is more frequent than the primary. (4) This complication is more frequent in primiparæ—viz., 70 per cent. of the cases. (5) The prognosis as regards the child is not worse than in pelvic presentations in general. (6) Cephalic version is advantageous before labour is advanced. It is not usually possible in the primary, but may be so in the secondary variety. (7) Most cases are delivered naturally. (8) Prophylactic reduction of the leg is only required in exceptional cases. (9) It is probable that flexion of the leg on the thigh is preferable to pulling down the leg into the vagina. (10) If aid is required in the lower part of the pelvis the soft fillet will usually effect delivery.

In discussing the paper, **Amand Routh** doubted whether the statement that the prognosis as regards the child was no worse when the legs were extended than in ordinary breech-presentation cases was correct; in general practice, at any rate, he believed the result was very different.

Champneys said that he had seen a case of primary extension of the legs in vertex presentation lead to difficult delivery. A patient with a normal pelvis and a small child fell in labour which could not be terminated by natural efforts. On examination a presentation of the vertex in the first position was found, together with presentation of the left arm and left foot. He suspected twins, and thought that the foot at least was contributed by a second fœtus. The child was delivered by forceps, and no twin was present. The legs after birth lay on each side of the neck. The newness of the subject might be illustrated by the fact that so careful and learned an observer as Matthews Duncan told him he had never seen a case of primary extension of the legs. As to the question when to interfere, interference should always be resorted to when in a case of breech presentation delay took place at any stage, even in the first stage. The paper illustrated the fact that the subject is not yet thoroughly understood. It might be thought that the cases of difficulty would be those of large children, contracted pelves, and primiparæ. But, on the one hand, many large children were delivered easily, many primiparæ even with large children experienced no difficulty, and contracted pelves accounted for a very small number of difficult cases. On the other hand, difficulties not infrequently occurred with normal pelves and small children. One mode of delivery was not insisted upon in any book that he knew, though it might be mentioned casually, and that was pressure from above.

Herbert Spencer read a paper at the Harveian Society on Feb. 18, 1897, on the Dangers and Diagnosis of Breech Presentations, and advocated the examination of all patients at the seventh month of pregnancy, and the treatment of breech presentations by external version at seven and a half months, followed by the wearing of an abdominal belt. He mentioned 6 cases which he had treated in this way, and in which the children were born as vertex presentations and survived, and 26 cases similarly treated in Pinard's clinic, with 1 immediate infantile death, 2 other children subsequently succumbing.

2. Treatment of breech presentations.

Achsharumoff (*Monats. f. Geburt. u. Gynäk.*, Jan., 1897) has adopted the practice of bringing down a foot as a prophylactic measure successfully in forty-two cases of breech presentation. He says that this procedure has no unfavourable influence on the course of labour; indeed pains weak before the manœuvre become strong after it. The chance of spontaneous delivery of the lower part of the trunk becomes greater, and if the labour lingers, the

trunk can all the more easily be extracted. The child is more likely to be saved when the foot has been brought down.

VII.—THE NEW-BORN INFANT.

1. Obstruction of the lachrymal duct in new-born children.

Landolt (*Annales de Gynéc. et d'Obstét.*, Jan., 1897) finds that this condition is not rare, and is often overlooked till much harm is done. The affection should be suspected whenever there appears to be conjunctivitis in one eye only a day or two after birth. The conjunctiva itself is not infrequently cured, so to speak, by appropriate lotions. The obstetrician, mistaking a complication, or result, for a primary disease, finds to his surprise that the eye continues to water, the lids becoming glued together, and a drop of pus often exudes from the inner canthus. This condition is yet more alarming in certain cases where no conjunctivitis has been observed. It looks like the beginning of purulent ophthalmia. Landolt lays down as a rule that obstinate unilateral lachrymation in a new-born child usually signifies obstruction of the tear-duct. As an ophthalmic surgeon he advocates sounding of the duct with a fine probe; on no account should the canaliculus be slit up. Afterwards weak antiseptic lotions must be injected into the duct by means of a Ruel's syringe; the infant must be turned on its face directly afterwards, lest any of the lotion be swallowed.

2. Syphilis in pregnancy.

Murray (*New York Med. News*, June 19, 1897) first quotes Fournier and Le Pileur as to the results of pregnancy in syphilitic mothers. Fournier's figures are 167 pregnancies, of which only 22 infants survived, the rest being either abortions, stillbirths, or early deaths. Le Pileur quotes 414 pregnancies with 295 deaths. Murray divides syphilis in pregnant women thus: (1) That acquired before pregnancy, in which there is nothing abnormal; (2) infection from the primary chancre of the father at a fruitful coitus, in which the primary sore in the mother appears earlier than in unimpregnated women and is more severe, this form of infection being most fatal to the child; (3) infection from a secondary lesion in the father, which, if it occurs in the earlier months of pregnancy, usually kills the child; if in the later months, is less dangerous to the child; (4) syphilis in both parents, when the effect on the child is the worst. With regard to the diagnosis, this is often difficult, since the primary sore is

not often seen. An examination of the husband should be made whenever possible. If the husband, thinking he is cured, having had no symptoms for some time, impregnates his wife, the disease usually appears in the third month. As regards treatment, Murray prefers inunction combined with tonics such as iron, arsenic, and strychnine. After birth the child should be treated through the milk by administering mercury to the mother. As the child grows older it is sufficient to place mercury ointment on a flannel binder. If the mother is too weak to suckle, the child must be fed by hand, no wet-nurse being admissible.

DISEASES OF THE SKIN.

By Malcolm Morris, F.R.C.S.Ed.,

Surgeon to the Skin Department, St. Mary's Hospital.

During the past year two important medical gatherings have been held—namely, the annual meeting of the British Medical Association at Montreal, and that of the International Medical Congress at Moscow. At each of these dermatology had a section assigned to it, and at each good work was done. As usual, however, the work was mainly pathological in character, treatment occupying a quite subordinate position. This circumstance indicates the direction in which dermatology is at present making most decided progress; and although the "practical man" may feel some impatience at the relatively slow advance of therapeutics, the scientific dermatologist sees in the increase of knowledge as to the causes and processes of disease the best hope of acquiring the power of effectively controlling them. The pathologist, in fact, must prepare the way for the therapeutist, unless the latter is content to be a mere empiric. Hence, although there is no definite advance in the treatment of skin diseases to record since the last edition of the "Year-Book" was published, the pathologists have made some progress in the making of roads along which we shall doubtless be able to move forward in the not distant future. But dermatologists during the past twelve months have done more than merely mark time; they have worked on their own account to improve the methods of dealing with the diseases that fall within their special province, and in some directions not altogether without result.

As in former issues of this work, I propose to consider first the new methods of treatment that have been adopted in various diseases; and, secondly, the new drugs, or novel uses of drugs already known, that have been introduced.

LUPUS VULGARIS.

The new tuberculin.

In each successive issue of the "Year-Book" I have to record the birth—or resurrection—of one or more methods of dealing

with lupus vulgaris. For every one of them more or less brilliant results are claimed. Unhappily, however, their efficacy would seem to be mostly due to some subtle factor inseparable from the personality of their inventors; the remedy is like the bow of Ulysses, which could be drawn by him alone. But in the case of so intractable a disease as lupus, it is the duty of the dermatologist to try every method of treatment that comes before the medical world with anything in the nature of a guarantee of scientific genuineness. For this reason, as soon as **Koch** published his account of his new tuberculin or T.R. (see p. 31), I lost no time in putting it to the test in cases of lupus vulgaris. Koch, in his paper (published in the *Deut. med. Woch.* of April 1, 1897) containing the description of his new "Mittel," stated that in several cases of that affection in which it had been used he had "invariably seen a considerable improvement take place," but he expressly refrained from speaking of any case as cured, "although in a number of observations one would be warranted in speaking of a cure in the current sense of the word." I had used Koch's original tuberculin in a number of cases of lupus vulgaris with only temporary benefit as far as the immediate effect was concerned. It is true that in certain cases the remedy appeared to exert a modifying influence on the process, so that subsequently surgical procedures were more lasting in effect than they had been before (see *Brit. Med. Journ.*, June 3, 1893, p. 1154); but after all, the measure of success obtained in that way, though real as far as it went, was far from fulfilling the expectations which one had been led to form by the exaggerated accounts that filled the medical journals in the first enthusiasm of the announcement of a "cure for tuberculosis."

My mental attitude in regard to the new tuberculin was, therefore, one more of scepticism than of even "benevolent neutrality." In conjunction with Dr. Arthur Whitfield I tried it in six cases of lupus vulgaris, following with scrupulous fidelity Koch's directions as to the mode in which the remedy should be used. The initial dose of the injection was $\frac{1}{500}$ of a milligramme; this was raised rapidly, care being taken not to excite constitutional disturbance, to 1—10 milligrammes. A detailed report of the cases was published in the *Brit. Med. Journ.* of July 24, 1897, p. 207 *et seq.* The improvement in all the cases was at first very marked. On the patients themselves the effect was to produce a sense of satisfaction almost amounting to elation. As for myself, I have never seen any treatment do anything like so much good. The change for the better in the affected parts was, in most cases, a veritable transformation.

Summarising the effects of the new tuberculin in the order in which they were observed there was: (1) A diminution of the surrounding halo of redness in those cases in which this had been present to a marked degree before the commencement of the treatment; in cases in which there were only yellowish brown nodules in a white scar the injections produced no visible effect at this stage. (2) The next change noticed was a slight depression in the centre of the nodules, leading to wrinkling, and later to desquamation of the cuticle. Then there occurred (3) steady healing of all ulcerated surfaces; and (4) slow subsidence of the previously permanent œdema of the lips, ears, etc. In two cases actual disappearance of the characteristic lupus nodules was noticed; in others, there was distinct shrinkage of nodules, with diminution in the scaling of the surface. Another marked effect of the injections was the softening and flattening of pre-existing scars.

At first, when only small doses were being given, there was little or no reaction, although in some cases a feeling of heaviness and drowsiness was complained of. When the larger doses (from 1 milligramme upwards) are reached, there is considerable febrile disturbance, sometimes with headache and pains in the limbs, some trouble in breathing, and a general feeling of depression with broken sleep. Locally, the erythema was generally increased, and the whole affected area, including even old-standing cicatricial tissue, was swollen. The phenomena of reaction quickly disappeared. On the whole we felt warranted at that time in affirming that the local effects of the new tuberculin in the cases here referred to had been uniformly good, and "in some cases distinctly brilliant." The constitutional disturbance had in no case been severe, and was always of a very transitory character. We were emphatic, however, in stating that the results then reported were not "cures."

For some weeks after the date of the report here summarised the lupus remained stationary; fresh nodules developed, but, on the other hand, none of those which remained at the end of the treatment disappeared, nor was there any further retrocession of the disease. Recently (November) in all the cases but one the good effect seems to have become exhausted But the improvement which follows the injections, even if it be only temporary, is so great that I am still disposed to have recourse to the treatment in cases where the constitution is not broken down. One objection to the free use of the remedy is its cost, which for hospitals is almost prohibitive, and in private practice is burdensome to all but wealthy patients.

On July 6th **O. Lassar** showed at the Berlin Dermatological Society (*Separat-Abdruck aus Dermatologische Zeitschrift*) five cases in which he had used the new tuberculin with striking immediate results—absorption of infiltrating material, decrease in size of nodules, and healing of ulcerated surfaces. He considers that the cases show that the injections paralyse "the local poisonous effect of the lupus nodules on the surrounding tissues," adding that one would not be warranted either in generalising as to the beneficial effects of the treatment from these few cases, or in excluding the possibility of a cure being effected by means of the remedy.

Seeligman (*Deutsche med. Wochenschrift*, No. 30, 1897) records his experience of the method in the case of a woman suffering from lupous ulceration of the nose and hand, together with erosions of the cervix uteri, with a purulent discharge containing a few tubercle bacilli, and tuberculous pyosalpinx and endometritis. After forty injections, which were borne with great difficulty, there was marked improvement in the general condition and in the lupous ulcerations of the nose and hand, as well as in the condition of the genital organs.

Doutrelepont (*ibid.*, No. 34) obtained good results in fifteen cases of lupus, although he complains of the general and local reactions and the uncertainity of the preparation. The age of the tuberculin has, in his opinion, some effect on the febrile reaction. There was a relatively rapid healing of the ulcerations, the hypertrophy diminished, and scar tissue soon appeared. The swollen lymphatics decreased in size, although some suppurated and had to be operated upon. The new tuberculin seems to him to have more curative value than the old, but care must be exercised in the dosage.

Van Hoorn (*ibid.*) had under observation ten patients with lupus, all of whom improved under the treatment; the colour of the affected parts became paler, the infiltration diminished, the small, irregular tubercles disappeared. The weight increased in four patients, was stationary in five, and diminished in one.

Gerber and **Prang** (*ibid.*) saw improvement in three out of six cases of lupus. They believe that in lupus, as well as in tuberculosis, when the patients are in good condition, and the affection is not too far advanced, the remedy is of value.

Juan L. Hohr, of Cadiz (*Anales Medicos Gaditanos*, July 15, 1897), records the case of a woman, aged thirty-six, suffering from superficial lupus of the nose and upper lip, which were the seat of scars; the disease was of eight years' standing. There was a fresh patch on the chin and another along the jaw. Injections

(1 and 2 c.cm.) of the $\frac{1}{600}$ solution caused disappearance of the redness around the patches, but the patient complained of great weakness and pain in the limbs, and of feeling "ill all over." The treatment was therefore discontinued. The author's experience leads him to conclude that the new tuberculin—even in the highest degree of dilution—always causes reaction, though the intensity may vary. Koch's statements cannot, he thinks, be reconciled with clinical facts.

R. Campana of Rome reports (*Il Policlinico*, October 1st, 1897) the effect of the new tuberculin in a case of nodular lupus of the face in a young man, which had not been influenced in any way by treatment of various kinds, including the use of the old tuberculin. The T. R. was administered during two months, with the result that a progressive diminution of swelling and subsidence of the nodules took place, so that the patches were no longer raised, and were distinguishable from the surrounding healthy skin only by being somewhat redder and rougher. Campana describes the effect of the new tuberculin as showing itself in diminution of the tuberculous infiltration, this diminution being more evident in spots where there were small nodules, the place of which is taken by superficial atrophy.

At the meeting of the German Association of Scientists and Physicians, held at Brunswick in the autumn of 1897, **Sternthal** (*Deutsche med. Zeitung*, October 11th) showed cases of lupus which had been treated with the new tuberculin. In two of these no good result was observed, although the dose was increased to 13 milligrammes of pure tuberculin. In one of the cases an old otitis media which had been cured many years before developed anew. In the third case (hypertrophic lupus of the nose) striking improvement followed the injections. On the same occasion Finger related three cases in which the results of the treatment were entirely negative.

At a meeting of the Dermatological Society of London on November 10, 1897, **Crocker** and **Pernet** showed two cases—one, a child of ten, with the freely ulcerating form of lupus, was immensely improved by the treatment, which, however, was not complete; the other, a young woman of twenty, with multiple nodular lupus of the face and ear, who had been treated as an out-patient, and in whom "the improvement was only very moderate in degree—certainly not worth the time and expenditure of money on the treatment." It should be added that on subsequent scraping the lupus tissue was found to be very resistant to the curette, a fact which may possibly account for the slight effect of the tuberculin.

Other methods of treatment.

Lupus has been treated by the application of the vapour of boiling water, but without result, penetration of the agent to any depth being prevented by condensation of the steam on the surface. **Hollander** (*Deutsche med. Wochenschrift*, No. 43, 1897) reports that for two years past he has treated the disease by *cauterisation with dry hot air*. The air is driven through a red-hot metal tube, which raises it to a temperature of 300° C., and it is directed on to the diseased parts. Under the influence of the current of hot air the healthy parts became quite bloodless and shrunken. The lupus nodules, on the other hand, project so that the hot air reaches them more directly and causes necrosis. A few days after the application the circulation in the healthy parts is restored, and the necrosed tissues are eliminated. Cicatrisation therefore starts from islets of healthy tissue scattered over the whole surface of the lupus; the result is a supple and non-contracting cicatrix. After the use of the hot air a dressing of borated lanolin should be applied to the parts, and should be left on for three or four days. The stench is sickening at first, but this ceases when the necrosed tissues have separated; after that cicatrisation can be quickened by painting the spots on which the disease was situated with a 3 per cent. solution of nitrate of silver. Of the cases treated in the manner described not one has relapsed. New foci appear from time to time, but they are always small and yield to one application of hot air.

Calomel injections have been used by **Asselberghs** (*Presse Méd.*, No. 65, 1897) with good results in fourteen cases. The dose was 5 centigrammes of calomel in one cubic centimetre of olive oil. The injections were at first given every ten days, but owing to the pain which they caused they had to be given less frequently. No symptoms of mercurial poisoning were observed.

Dubois-Havenith has quite recently, at a meeting of the Paris Société de Dermatologie et Syphilographie (*Sem. Méd.*, Dec. 15th, 1897), confirmed the statements of Asselberghs; he pointed out that the treatment should be used only exceptionally, and that it may with advantage be combined in certain cases with other methods. **Scarenzio** (*Gazz. Med. Lombarda*, April 19th, 1897) has successfully treated three cases in the same way.

Permanganate of potassium has been used with advantage in eleven cases by **L. Butte** (*Ann. de la Polyclin. de Paris*, January, 1897). It is applied by means of compresses saturated with a solution at first of ½ per cent., gradually increased to 2 per cent. The application, which is made daily and continued for ten or

fifteen minutes, causes some pain, which is speedily relieved by the use of a cocaine ointment. The effect claimed for the treatment is that lupus nodules disappear and the progress of the disease is arrested.

The *Roentgen rays* have been used in cases of lupus in the Breslau clinic by **Loewenheim**, and at Hamburg by **Kümmel**, with good results. **Finden** of Copenhagen has also used *concentrated sunlight* and the *electric light* (69 *Versamm. Deutscher Naturforscher und Aerzte*, Braunschweig, 20–26 September, 1897).

LUPUS ERYTHEMATOSUS.

Josef Schutz (*Archiv. für Dermatologie und Syphilis*, Bd. xxxviii., Hft. 1, 1897) uses local applications of Fowler's solution 4 grms., distilled water 20 to 30 grms., and chloroform 2 drops. This solution is applied morning and night, and is allowed to dry upon the skin. The chloroform is added to prevent change in the solution. The first few days there is no change in appearance, but about the fourth or sixth day there is slight swelling, increased redness, and sensitiveness; then a powder or paste is applied in the next four to eight days. The swelling diminishes, the surface becomes pale and exfoliates. The solution is again painted over the affected surface as before. In from ten to eleven weeks the case is cured. This treatment is not followed by cicatricial atrophy of the skin. The author believes with Binz, that the action of the remedy is due to reduction and oxidation. The arsenic becomes arsenious acid; this, again, changes into the arsenical salt; this change takes place whenever and wherever arsenic comes in contact with living protoplasm, and the amount of reaction is in direct proportion to the quantity of protoplasm in the cells. He has treated ten cases in this manner with uniform success, and so far there has been no relapse.

ECZEMA.

Picric acid.

Aubert ("Traitement de l'Eczéma par l'Acide Picrique," *Thèse de Paris*, 1897) says that, speaking generally, the use of picric acid is indicated in those forms of eczema in which the inflammation is acute and superficial, and where the lesions are chiefly epidermic. The keratoplastic action of the remedy cannot be exerted in the chronic forms of eczema, which are accompanied by induration and thickening of the epidermis. In acute conditions the acid forms, on contact with the ulcerated, "weeping" surfaces, a protective coating composed of coagulated proteid substances

and epithelial *débris*, beneath which the growth of new epidermis proceeds rapidly. When the crusts come away the underlying skin is found perfectly dry, without any redness, and covered with newly formed epidermis. The application of picric acid, moreover, causes almost immediate cessation of itching, and this effect is produced in chronic as well as in acute conditions. The treatment is indicated: (1) in acute vesicular "weeping" eczema; (2) in acute exacerbations occurring in chronic cases; (3) in the impetiginous eczema of children; (4) in chronic eczema where itching is troublesome. The remedy is used in a saturated solution as follows:—

Picric acid	12 grammes
Tepid boiled water	1 litre

M. Allow to cool and decant.

This solution is easy to prepare and will keep unchanged. It is painted over the affected surface, care being taken to carry it a little beyond the limits of the disease. Then the parts are covered with gauze or compresses of tarlatan (a kind of open, transparent muslin) squeezed out of the same solution; over this is placed a layer of cotton wool. On no account must oil-silk, or any other substance that will prevent evaporation, be placed over the dressing, otherwise cicatrisation will be hindered by maceration of tissues. The dressing should be renewed every two or three days. In changing it the gauze may be found to be adherent to the surface; it should be detached carefully by wetting with tampons impregnated with picric or boracic acid. When healing has taken place the skin is sometimes harsh and hard; it can be softened by a few applications of borated vaseline. Aubert gives full particulars of twenty-three cases successfully treated by the method described, in the Hôpital St. Antoine, under the care of M. Gaucher. He concludes by affirming that picric acid is neither irritant nor caustic nor toxic, can be used in children, and can be applied to extensive surfaces without inconvenience. A cure is effected in ten to fifteen days.

Gaucher himself speaks highly of the treatment (*Soc. Méd. des Hôpitaux*, May 21, 1897). Excellent results have also been reported by **MacLennan** (*Brit. Med. Journ.*, Dec. 27, 1896); **Brousse** (*Nouv. Montpellier Médical*, Sept. 5, 1897), who, before applying the acid, asepticises the cutaneous surface by washing with a solution of boric acid; **Leredde** (*Ann. de Derm. et de Syphiligr.*, June, 1897); and **L. Pluymers** (*Ann. de la Soc. Méd. Chir. de Liége*, July, 1897). On the other hand, **François** (*Ann. et Bull. de la Soc. de Méd. d'Anvers*, July-August, 1897), who

has tried the method in two cases of acute and three of chronic eczema, and in seven of artificial eczematoid dermatitis in workmen, reports that, so far from doing any good, it caused aggravation of the condition at once in nine of the cases, and later in the remaining three. He therefore agrees with Besnier and Darier that the action of picric acid cannot be depended on, being sometimes beneficial, sometimes not, and often causing irritation. **H. Waldo** (*Brit. Med. Journ.*, Feb. 6, 1897) observed symptoms resembling carbolic poisoning in a case of eczema which he treated with picric acid.

Bilberry.

The treatment of obstinate eczema by means of a concentrated decoction of vaccinium myrtillus (*vulgo* bilberry, blaeberry, or whortleberry) was (says **Professor Stockman** in the *Edinburgh Medical Journal*, December, 1897) first tried by Winternitz, who gives his reasons for using it in the following words:—"The observation that a highly concentrated watery decoction of the bilberry not only colours intensely the epidermis and horny growths from it, but also overspreads the skin with an adhesive unirritating covering, led me to use it in cases where fatty and irritant applications increased the local affection." He found that in discharging eczemas rapid benefit was obtained; that under its action "weeping" ceased in a few hours, the hyperæmia of the skin diminished, and normal epithelium tended to replace the unhealthy layer. Itching also was greatly lessened or entirely disappeared, much to the increased comfort of the patient. **Fried, Utschik,** and **Wertheimer** have recently reported certain cases which they treated with this preparation (*Bl. f. klin. Hydrotherap.*, Wien, October, 1897). They find that its action is extremely beneficial in severe cases of sycosis with eczema of the face. The decoction is painted over the affected parts and covered with a thin layer of cotton wool, when the whole becomes so intimately attached to the hairs that in forty-eight hours the dressing may be gently removed, and brings away with it, with little discomfort, all the hairs. They report at length a case of severe eczema of the face, scrotum, and perineum, in a man of forty-six years of age, which was healed completely in three weeks by this method of treatment, after lasting for eighteen months. Two cases of general eczema in a girl of seventeen and in a man of seventy-six also gave excellent results. **K. Kraus** (*ibid.*, No. 9) has also found extract of bilberry useful as an application in eczema. He used it in combination with hydrotherapy.

LICHEN PLANUS.

Biniodide of mercury.

For some time past I have used biniodide of mercury as an internal remedy in cases of generalised lichen planus with highly satisfactory results. A short paper embodying my experience of this treatment in some twenty cases was published in the *St. Louis Medical and Surgical Journal* for October, 1896. At first I used this method of treatment as complementary to a course of arsenic given in the ordinary way. Afterwards I used the biniodide alone with equally good results. The following may be taken as a typical formula :—

℞ Liq. Hydrarg. Perchlor. ... ... ʒj.
Potass. Iodid. ... ... gr. xl.
Decoct. Sarsæ Co. ... ... ad ℥viij.
M. Ft. mist. Sig. Two tablespoonfuls three times a day.

I have tried this treatment in the chronic localised form of lichen planus without appreciable benefit. How the remedy acts is not quite clear. It is well known, however, that mercury, besides its parasiticide action, has valuable tonic properties. It neutralises the effect of toxins circulating in the blood, increases the number of red corpuscles, and quickens the activity of tissue changes. These properties would *à priori* indicate that mercury is likely to be useful in an acute process like generalised lichen planus.

J. Abbot Cantrell (*Philadelphia Polyclinic*, July, 1897) reports a case of generalised lichen planus in a man in which one-fourth of a grain of mercury biniodide was given three times a day, with recovery after five months of treatment; externally he applied liquor carbonis detergens, two drachms to the ounce of water. Nine years later the patient again presented himself with a similar eruption, which again subsided under the same treatment. Another case was treated with arsenious acid, one-thirtieth of a grain three times a day, and locally with a lotion containing three drachms of carbolic acid to a pint of water. A third was given some saline mixture, and locally inunctions of two grains of mercuric chloride to one ounce of petrolatum, which relieved him in about three weeks. A fourth was much relieved by the administration of the extract of cantharides in the dose of half a grain thrice daily. Cantrell believes that the biniodide of mercury in the first case, and the extract of cantharides in the fourth case, show a result as decided as that from the use of arsenic, and are worthy of a further trial.

PSORIASIS.

Intravenous injection of arsenic.

Herzheimer (*Berlin. klin. Wochenschr.*, No. 35, 1897) has used the intravenous method of administering arsenic in twenty-three cases of psoriasis, with the result that ten were cured and nine notably improved. The injections were made, with strict antiseptic precautions, into veins at the bend of the elbow or behind the knee, the dose being at first 1 milligramme of arsenious acid, and being increased every day till a dose of 15 milligrammes was reached, which was continued till the patches had completely disappeared. The treatment occasionally caused some secondary troubles—small thromboses (two cases), tiny furuncles, arsenical neuritis, and diarrhœa. Relapse occurred in the cases as after all other modes of treatment. Herzheimer recommends that psoriasis should be treated, as syphilis is, by intermittent medication, the intravenous administration of arsenic being supplemented by internal treatment.

Cacodylic acid.

Danlos (*Therap. Woch.*, iv., p. 560) treated a long-standing and obstinate case of generalised psoriasis successfully with the following mixture :—

Cacodylic acid	2·5 gmes.
Rum	20 gmes.
Syrup of orange peel	20 gmes.
Oil of peppermint	2 drops.
Distilled water	60 gmes.

At first six teaspoonfuls of the mixture were given daily, the amount being after three weeks reduced to four. Except a garlicky smell of the breath and slight intolerance of the stomach at the end of the third week, the treatment caused no discomfort. The disease, which had existed for eight years and had resisted various kinds of treatment, yielded quickly. Recurrences became less frequent and less severe, redness diminished, the scales fell off, and the thickening of the skin became visibly less.

Testicular extract.

At a meeing of the Paris Academy of Sciences (*Presse Médicale*, July 17, 1897), **Guyon** reported the results obtained by **Bouffé** with the use of testicle juice injected subcutaneously, in amounts progressively increased from ten to twenty centimetres daily, for periods of time averaging about three months. He had thus

treated sixty-one men and twenty-two women with generalised psoriasis of long standing. Seventy-seven per cent. of them had been cured, and there had been no relapse in periods varying from two to five years.

ALOPECIA AREATA.

R. Panichi, of Florence (*Settimana Medica* and *Monatsh. f. prakt. Derm.*, No. 4, 1897), has treated sixteen cases of alopecia areata by the following method of local stimulation :—After first rubbing the bald patches with a 1 per cent. solution of corrosive sublimate in glycerine, isolated punctures are made at the circumference of the patch with the needle of a Pravaz syringe, the point of which has been steeped in a mixture of carbolic acid (3 to 4 parts) and tincture of cantharides (6 to 7 parts); the same mixture is then painted over the bald surface, and, if possible, injected with the syringe into the hair follicle. The punctures should be repeated every four to six days, according to the tolerance of the patient, the affected places being painted with the solution on the intervening days. In all the cases the treatment was successful, although several of them were of old standing, and others very extensive and refractory to other treatment.

KELOID.

Sinclair Tousey (*New York Med. Journ.*, Nov. 6, 1897) has found thiosinamine very useful in the treatment of keloid. He administers it hypodermically in a solution containing 1 part of the drug to 10 parts of sterilised water. The maximum dose of the drug is about 3 grains, which is most advantageously injected into the muscular tissue. Tousey was led to investigate the action of thiosinamine by observation of its effect on the scar tissue surrounding lupus in cases in which the drug was being used on account of its supposed destructive effect on tubercle bacilli. Its hypodermic administration brings about an immediate disintegration and elimination of white blood corpuscles. This is followed by leucocytosis lasting forty-eight hours. In this property of the drug, which produces an increase in cellular activity in the fixed connective tissue cells throughout the body, Tousey finds the explanation of its value in the treatment of keloid.

Artificial serum in skin diseases.

Tommasoli (*Riforma Medica*, July 5, 1897) has for some three years used injections of an artificial serum composed of chloride

of sodium and bicarbonate of sodium in certain skin affections which he believes to be due to chronic infective intoxication or auto-intoxication. In some cases—two of diffuse chronic eczema, one of scattered folliculitis, one of senile pruritus—a cure had been effected; a case of lichen planus, in which itching was very marked, was cured in thirty-six days. The same treatment had also been successful in cases of psoriasis and various pruriginous affections. Tommasoli has also used the artificial serum (in doses of 300–400 grammes) with the object of preserving life in cases of extensive burns, with results which he considers sufficiently encouraging to warrant further trial.

Serum treatment in leprosy.

Juan de Dios Carrasquilla, of Bogota, has treated a number of cases of leprosy with serum taken from horses immunised by means of blood serum taken from lepers (Proc. Acad. of Medicine of Colombia: *Correio Med. de Lisboa*, 1896, xxv., 122, 124). The results are said by him to be good, and the method has attracted so much attention in his own country, where leprosy is common, that an institute for the preparation of the therapeutic serum and a hospital for the treatment of lepers, both under the direction of Carrasquilla, have been established by the Colombian Government. The treatment has been tried in the Saint Louis Hospital, Paris, under the supervision of a committee of the Académie de Médecine. A preliminary report which was presented to the Academy by this committee on Sept. 28, 1897, was, on the whole, unfavourable to the treatment. In a case treated with Carrasquilla's serum by **Buzzi** (*Deutsche med. Wochenschrift*, Oct. 14, 1897) the patient's condition markedly improved in every respect and the results were much better than any that had been obtained by other methods.

At the International Leprosy Conference recently held in Berlin **Arning** stated that he had obtained good results by the serum in one case, and **Neisser** said he had seen improvement in some instances. **Dehio, Barillon, Hallopeau,** and **Abraham** have used it without any advantage.

Deluca (*Giorn. Ital. d. Mal. Vener.*, xxxi., 2) treated a case of leprosy by injection of serum from a rabbit inoculated with the disease. The effects were analogous to those seen in cases of tuberculosis after the injection of tuberculin. Another case was treated by injection of blood serum from another leper in whom the disease was in a latent state, but without any result.

Thyroidin.

V. Zarubin, of Charkoff (*Archiv. f. Derm. und Syph.*, Bd. xxxvii.,

Heft 3, December, 1896; *Brit. Journ. Derm.*, July, 1897), has used thyroidin in four cases; three of psoriasis, and one of sycosis idiopathica. In the cases of psoriasis a total amount of 30 grammes was given, the treatment extending over forty days; in the case of sycosis the amount given was 11·5 grammes, in twenty-seven days. No other drug was given, and no change of diet was prescribed. In all the cases the frequency of the pulse was markedly increased, in one to 130 per minute. The temperature in one case rose to 39·8° C. on the fifteenth day. Headache, chiefly frontal, with weakness, languor and pallor, was present in all the cases.

All the patients lost weight, and in all the digestion was disturbed, and nervous disturbance, manifesting itself in sleeplessness, fidgetiness, etc., occurred. The amount of urine was increased in all. No albumin was detected. As regards the skin disease, the effect of the drug was *nil*. Zarubin concludes that thyroidin is useless in cutaneous affections, and that it is so dangerous that its administration requires the greatest care. He offers no opinion as to the causation of thyroidism, but refers to the possibility of its being due to albumin compounds not necessary to the beneficial action of thyroidin. Bacilli, resembling those of malignant œdema, have been found in thyroid tablets by O. Lanz. The composition of the tablets used by Zarubin was as follows:

℞ Thyroidini exsiccati ... ... 2 grammes
Sacchari lactis ... ... 15 grammes
M. Fiant trochisci xx.

Currents of high frequency and high tension.

At the twelfth International Congress of Medicine, held at Moscow, August, 1897, **Oudin** and **Barthélemy**, of Paris, claimed that these currents have a powerful trophoneurotic action, and may be employed with success in diseases of various kinds. Certain eczemas, psoriasis, and even lupus, are favourably influenced by them. They seem to have a special parasiticidal action, "as proved by the rapid cure of affections exclusively parasitic, such as molluscum contagiosum." The high frequency is obtained in the apparatus of d'Arsonval; the high tension by attaching to it a resonator and a special electrode constituted of a metal wire surrounded by glass, the whole acting as a condenser, which attacks the diseased surface by numerous little sparks.

Franklinisation.

At the International Medical Congress at Moscow, **H. Bordier**,

of Lyons, gave an account of a new method of treating **acne** by **franklinisation.** He employs the procedure in the punctate and pustular forms of acne. The method consists in subjecting the patient to the action of the electrostatic bath and to that of the electric bath. He is isolated on a stool with glass feet, and he is placed in electrical communication with the negative pole of an electrostatic machine of high discharge. Each sitting lasts fifteen minutes, and the procedure is repeated every two days. The method is said to have a great influence on the vasomotor system, the effect of which is to cure the acne.

Doumer (*Bulletin de la Soc. d'Électrothérapie*, May, 1897) reports five cases of impetigo cured by franklinisation. Often after the first sitting, he says, and almost always after the second, the erythema begins to disappear; then in a short time the crusts become dry and fall off, leaving the surface of a light-rose colour, which soon gives place to the normal hue.

Static electricity.

Schatzky (*Vratch*, No. 25, 1897) reports a case of psoriasis of four years' standing in a neurasthenic physician aged 32, which was cured by static electricity (three sittings of twenty minutes every week) combined with moderate diet and raw milk. Itching diminished after two or three sittings, and the patches gradually disappeared.

Electrolysis.

W. A. Hardaway (*Journ. of Cutan. and Gen.-Urin. Diseases*, Sept., 1897) gives a general summary of twenty-four years' experience of electrolysis in the treatment of diseases and deformities of the skin. In the case of keloid he confines the operation to small growths. In telangiectasia, certain kinds of vascular nævi, the so-called spider nævi, etc., there is no better and more satisfactory agent in the hands of a judicious operator; but, taking the port-wine mark as a whole, the method has not met with the success that he had originally anticipated from it. In small foci of lupus, and for separate nodules, and especially relapsing tubercles, electrolysis is superior to the mechanical and caustic methods in vogue; but for large areas of infiltration and ulceration it is tedious and inferior to the other measures. In tuberculous infiltration of the skin, other than lupus vulgaris, Hardaway regards electrolysis most favourably. In lupus erythematosus, though he does not advise it in acute superficial forms, it has been of great service in his hands in chronic patches with much thickening. As regards technique, Hardaway has long discarded the positive sponge electrode—which, even

when he used it, he never allowed the patient to grasp, but merely to touch with the finger-tips. He now always places the positive pole electrode in a small bowl or tumbler of water, and the connection is established by inserting one, two, or three fingers, as may be required. Even trifling operations should be done under the strictest antiseptic precautions. Immediately after an electrolysis the parts should be fomented for five or ten minutes with very hot water, and this procedure should be repeated at least twice on the same day, but not afterward. In this way the redness and tumefaction are at once allayed, and subsequent inflammatory changes are largely prevented. As a rule, after the first day, no other applications or dressings are required.

DISEASES OF THE EYE.

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1. New remedies.

Amongst the new, or comparatively new, drugs which have recently been introduced into practice, *arecoline* may be mentioned. According to Merck, whose paper is referred to by **Prof. Snellen** (in the American "System of Diseases of the Eye," 1897, p. 46) the hydrobromic salt of this alkaloid keeps better than eserine, acts more powerfully than pilocarpine, and is much cheaper. It does not irritate the eye, and, even after repeated instillations, does not produce headache or other complications. A 1 per cent. solution induces myosis in five minutes. The maximum contraction of the pupil (the diameter being then 1½ mm.) occurs fifteen minutes after the instillation and lasts for thirty minutes. After seventy minutes the pupil regains its original size.

A remedy which in chemical language bears the cacophonous title of P. diethoxyethenyldiphenylamidine, but which will be more easily remembered by its therapeutic name of *holocaine*, has been introduced by **M. Gutman** (*Deutsche med. Wochen.*, 11 March, 1897), who uses it in the form of the hydrochlorate. It is a local anæsthetic, and a few drops of a 1 per cent. solution, applied to the conjunctiva, renders it quite insensible. The effect lasts about ten minutes, it does not affect the size of the pupil, nor does it modify the intra-ocular pressure. It should be borne in mind that holocaine is highly poisonous, the toxic dose, according to **Heinz** (Berger, *Archives d'Ophtalmologie*, 1897, vol. xvii., p. 589), being 1 cgr. for holocaine, 5 cgr. for cocaine, and 75 mgr. for eucaine.

A. Cattaneo of Bologna (*Annali di Ottalmologia*, vol. xxv., Fasc. 4) describes at length some experiments and clinical observations he has made on a new mydriatic named *midrol* or iodomethylated phenilpirazol.

Lastly, **Dr. B. Treutler** (*Klinische Monatsblätter für Augenheilkunde*, Jahrgang xxxv., September, 1897) recommends a remedy named *euphthalmin*. It has the same relation to eucaine that homatropin bears to tropacocaine, and it is a powerful mydriatic acting slowly after the lapse of ten minutes after the instillation of a 2 per cent. solution, producing its maximum effect in about one hour without pain, but with the abolition of the power of accommodation. The return of the pupil to the normal size and recovery of accommodative power take place much more quickly than with atropin or homatropin.

M. Débagory-Mocriévitch has for several years employed with advantage a crayon or *pencil of caoutchouc* for the expression of granulations and trachomatous infiltrations, and considers it to be superior in its effects to the nails or to forceps. The conjunctiva should be powdered with some indifferent powder, and the massage with the crayon is effected by placing it beneath the upper lid. An additional advantage is obtained if the surface which has been subjected to friction is cauterised with a stick of copper sulphate (*Archives d'Ophtalmologie*, t. xvii., No. 9, 1897, p. 569).

Although not by any means a new remedy for the removal of leucomata and nebulæ of the cornea, the extract of the *chelidonium majus* has been recommended by **M. Krayski** (*Wiestnik Ophthalmologni*, May-June, 1897) as a new means of treating cancer of the eyelids. He injects about 50 cgr. of the extract into the healthy tissue adjoining the ulcerated surface, and then covers the whole surface with a pad of iodoformed gauze dipped in the same liquid. The pain lasts for some hours, or even for a day. One or two injections are sufficient, and the surface is brushed over with the extract once or twice daily. A well-marked swelling surrounds the affected parts, and sharply separates them from the healthy tissue, and cicatrisation soon commences.

The Electric Treatment of Painful Conditions of the Eyes, is the title of a paper by **Prof. Benedikt**, of Vienna (*Archiv für Ophthalmologie*, b. xliii., 1897, p. 683). He recommends that the current should be transmitted through the lids, and not, as Prof. v. Reuss recommends, through the conjunctiva, on account of the pain that is excited. The current should be applied by means of the finger, which enables the operator to recognise whether the current is too strong. He thinks the induced current possesses decided advantages over the constant. The induced current has the peculiar power of deadening the sensibility of the spot on which it acts, so that the strength of the current can be consider-

ably, if gradually, increased. This renders it particularly applicable to all forms of cephalalgia—as tic douloureux, arthralgiæ and ophthalmalgiæ. Its catalytic action is also considerable, though perhaps in this respect it is inferior to the constant current. It nevertheless acts well in trophic disturbances, and especially in inflammatory troubles. The physiological and pathological changes involved are, however, very complicated, including modifications of the blood vessels, the quantity of blood traversing them, the breaking down of inflammatory products, and neoplastic formations, and the carrying off of disintegrated material. This catalytic action may be observed in inflammation of the sclera and cornea and of the conjunctiva and iris. Many of these cases, ordinarily termed inflammations, he is inclined to think are really neuralgic, and he supports his view by referring to the benefits obtained from the application of heat, cold, pressure, and faradic stimulation which may act on nerve fibres and expansions. He quotes a case in which a man of sixty years suffered from violent supraorbital and ophthalmic pain, accompanied by strong injection of the conjunctival and scleral vessels, with haziness of the cornea. Section of the supraorbital nerve effected a cure. The inflammatory symptoms in this case were, he contends, neuralgic. He recommends faradisation in cases of anæsthesiæ, in asthenopia, in mydriasis and in myopia, in addition to galvanisation of the parts.

2. Auto-infection in diseases of the eye.

An important paper by **M. Panas** (*Archives d'Ophtalmologie*, March, 1897, p. 273) was read before the 15th Congress of the Société Française d'Ophtalmologie, on this subject. Auto-infection he defines to be the infection of the eye or of its annexes through or by means of the circulation, and it may occur as a consequence of the presence of germs and toxins introduced from without, or from the products of disintegration which are either in excess, or which have been imperfectly eliminated by the natural emunctories, as the uterus, kidneys, liver, alimentary canal, skin, and lungs, and to these may be added the retention of internal secretions of certain glands like the thyroid. In addition, the various forms of virus known as the syphilitic, variolous, and vaccinal, as well as the virus of rabies and the miasms, may be mentioned as provocative agents. A subordinate but still important *rôle* is played by the diathesis or constitutional condition, as by arthritism, the lymphatic habit, alcoholism, diabetes, and albuminuria. The various forms of microbes and of pathogenic toxins are as yet but imperfectly known, but even with the same species of microbe the virulence varies according to the conditions of the medium, the number of the microbes their association, and the frequency

of their attack, and it is particularly worthy of notice that they may long remain quiescent, constituting what is termed latent microbism. The effects of all these agents on the tissues are shown by phlegmonic processes from œdema to suppuration, by hæmorrhages with or without intravenous thromboses, or lastly by hyperplastic conditions which may be either benign or malign. The action of microbes on the nervous system, which they excite or paralyse, is worthy of special attention, since the resistance of the organism depends upon it. It has been shown, for example, that if the nerves of the kidney be divided near the hilum, the subcutaneous injection of staphylococcus or streptococcus occasions double nephritis, although no such localisation is observed in uninjured animals. So, too, if rabbits be inoculated with tuberculous matter and one vagus be divided, double pulmonary bacillosis develops, which, however, is more pronounced on the injured side than on the other. In applying these general observations to the eye in particular, Panas remarks that the participation of the eye in various pathological conditions of the system has been clearly established. Thus inflammatory troubles are known to be associated with variola, scarlet fever, and measles. Amongst the dyscrasiæ we find diabetes, albuminuria, uræmia, oxaluria, and phosphaturia, gout and chronic rheumatism, leukæmia, scurvy, and the sequelæ of syphilis. Then there is the large group of infectious diseases, some of which come from without, whilst others develop within the tissues, constituting auto-infection properly so called. In both of these cases we are dealing with ocular endo-infection, in opposition to direct exo-infection. The infective external agents which attack the eye by internal paths are syphilis, endo-ocular tuberculosis, lepra, certain manifestations of blennorrhagia, pyæmic fevers, both puerperal and traumatic, typhus, cerebro-spinal meningitis, influenza, erysipelas, diphtheria, pernicious anæmia, paludism. Amongst chemical poisons are alcohol, nicotine, carbon bisulphide, santonin, quinine, and others, which attack the eye, and, chiefly, the optic tract, producing various well-known forms of amblyopia and atrophy. The concluding observations made by Panas in his paper are to the effect that every infective focus, in whatever part of the body it may be situated, should be investigated with the greatest possible care, since it may either directly or indirectly act on the eye. In women the utero-ovarian tract is a fertile source of trouble, as may be deduced from the instance of the so-called metastatic ophthalmia of puerperal origin, which is a typical example of this form of disease.

There is reason for believing that the aqueous humour plays an important part in promoting endogenous infections of the iris, and **Dr. F. Benoit**, of Liége (*Archives d'Ophtalmologie*, July, 1897, p. 409) has devoted much time to the consideration of this subject. It is generally admitted in textbooks that the aqueous humour is chiefly secreted by the ciliary processes, but in part also by the iris. Dr. Benoit, however, has satisfied himself that no aqueous humour is secreted by the iris, but that, on the contrary, the anterior surface is an absorbing surface; indeed, Professor Fuchs has shown that there are here really openings, or stomata, on the front aspect of the iris, especially near the pupillary and ciliary margins, which establish a communication between the anterior chamber and the lymphatic spaces of the iris. In man the stomata are larger, and it is not difficult to perceive that, as Nuel demonstrated at Carlisle in 1896 at the British Medical Association, in a case of corneal ulcer with hypopyon following lagophthalmos, the cells make their way through the stomata and form small collections in the depressions and pits of the iridal tissue. Similar conditions occur in syphilitic and tuberculous inflammation. Benoit, therefore, holds that in cases of irido-cyclitis a condition of inflammatory œdema is established at the plane of the ciliary processes which favours the entry into the aqueous humour of micro-organisms and their toxins. The aqueous humour thus infected is absorbed by the anterior surface of the iris, and causes inflammation of this organ. The reason of the beneficial effect of atropine in these cases is manifest, for by dilating the pupil the iris is prevented from acting as an absorbing or eliminating organ, and is thus protected from infection.

3. Choroid.

The mechanism of ruptures of the choroid has been the subject of a short paper by **Fage** of Amiens (*Archives d'Ophtalmologie*, July, 1897, p. 401). The position of these ruptures, he points out, is usually at or near the posterior pole of the globe, and their form is not unfrequently crescentic. Ammon thought they were caused by the direct pressure of the contusing agent; Knapp to contre-coup; Bertin and Arlt, to the compression causing distension of the contents of the globe; Otto Becker, to the concentric pressure which the optic nerve exercised at the moment of injury on the posterior pole. Fage himself contends that the eye, at the instant of contusion, is between two resistances—the wall of the orbit on the one hand and the insertion of the optic nerve on the other; the choroid stretched and but little capable of distension, owing to the vessels passing between it and the sclerotic, tears in a direction perpendicular to that of the traction.

Cataract.

The performance of a preliminary iridectomy in the extraction of senile cataract has been urged by **W. F. Coleman**, of Chicago (*Annals of Ophthalmology*, vol vi., April, 1897, p. 218). He contends that there are many points in its favour, as, for example, the opinion of many experienced operators that it is an eminently safe method; and he points out that the maturing of an unripe cataract is frequently hastened; that the diagnosis of the character, extent and size of the cataract is facilitated; that there is no hæmorrhage from the iris; that the iris is not wounded by falling over the knife; that an unobstructed opening is afforded for the introduction of the cystitome, and for the expulsion of the lens and cortex; that the wound of the iris is healed, leaving only the corneal incision to unite; that the iris is not exposed to pressure and stretching as in the simple operation; that the operation is shorter and less painful than the combined method; that it lessens the danger of iritis, and allows the cataract to be removed before it is quite mature; that it is the operation best suited to complicated cataracts, and not unsuited to any; and, lastly, that preliminary iridectomy exposes the eye least to the need of a secondary operation.

M. Chibret, of Clermont-Ferrand (*Archives d'Ophtalmologie*, t. xvii., Sept., 1897, p. 545), strongly recommends irrigation of the anterior chambers after extraction of the lens in hard cataract operations, where it is difficult, or impossible, by pressure or the use of the curette to obtain a clear pupil. He takes advantage of a double-action injecting and aspirating syringe. This instrument, which has been constructed for him by Aubry, of Paris, requires to be very carefully made and kept scrupulously clean. The fluid he injects is a warm saturated solution of boric acid, with the addition of 1–20000 part of mercury cyanide, and about from 20–30 grammes are injected. The cases in which it is especially valuable are soft, incomplete and traumatic cataracts. He considers that it diminishes the chances of infection, of prolapse of the iris, and of secondary cataract.

4. Operations on the iris.

M. Gayet, of Lyons (*Séance du 3 au 6 Mai de la Société Française d'Ophtalmologie*, in *Recueil d'Ophtalmologie*, 1897, p. 323), having found difficulty in operations on the iris when made with elbowed, curved or bent instruments through the small wound of the cornea made by a keratome, recommends that an incision embracing one half of the periphery of the cornea should be made, and that the large flap of cornea should be reflected, exposing the iris freely. He has practised this proceeding, and does

not find that it is followed by any opacity of the cornea, nor by pain, whilst it enables the iris to be dealt with much more easily. He has devised a special form of toothed forceps, by means of which the cornea can be seized and firmly held.

5. Atrophy of optic disc.

M. Galezowski (*Recueil d'Ophtalmologie*, June, 1897, p. 319) has endeavoured to establish a distinct class of cases of atrophy of the optic disc due to lymphangitis, and subdivisible into those that are peripheric in their origin and those that originate in the central lymphatic spaces. He believes them to be amenable to treatment. His classification of forms of optic atrophy are those proceeding from disease of the cortex cerebri, those which proceed from lesion of the central visual organs, those of glaucomatous origin, and those which result from changes in the nutrient fluid in the course of the optic nerves.

6. Artificial eyes.

The deformity which results from the removal of the globe of the eye has led to the adoption of various means for the concealment of the defect, and the skill of the glass-worker has been utilised to produce a shell that imitates, in the colour of the iris and average size of the pupil, the characteristics of the remaining eye; but in many instances great difficulty is experienced in adapting the artificial substitute to the form of the orbit, proving sometimes too large, sometimes too small; whilst its immobility directs the attention of the casual observer to that which is desired to be concealed, as much or even more than if no attempt to hide the loss had been made. The proceeding termed exenteration, in which the cornea is removed, the contents of the globe are scooped out, and the edges of the wound brought together, frequently affords a good stump for an artificial eye, since the muscles are retained with the atrophied sclerotic, and movements co-ordinate with those of the opposite eye can be effected. But the retention of such a contracted and atrophied globe is not always expedient, especially in cases of threatened secondary glaucoma and of sympathetic ophthalmia, and the same objection holds in regard to Mules's operation, in which after exenteration a small aseptic glass globe is introduced into the cavity, either of the sclerotic, or, as Lang has suggested, of the capsule of Tenon, and allowed to remain in position.

M. Chibret again has proposed the transplantation of the entire excised eye of the rabbit, but it is found that the foreign globe is gradually extruded from the tissues to which it has become temporarily adherent. Lastly, **Dr. Belt**, of Washington, has proposed the implantation in the hollow left by the excised

eye of a piece of fine sponge rendered properly aseptic. Very perfect results can sometimes be thus obtained. A special study of these various means of forming a suitable stump has been made by **M. A. Bourgeois** (Galezowski's *Recueil d'Ophtalmologie*, p. 305). He employs a ball, of which the centre is composed of thin sterilised catgut, which has been rolled by the fingers into a sphere of the size of a pea; around this he winds black silk of the size of No. 5 or 6 till it attains the requisite size, the end being passed through the eye of a needle which is made to traverse the ball. He prefers black to white silk as it is more readily seen in the event of its removal being necessary, and he thinks the diameter of the ball should be one centimetre, and about four metres of silk are required to make a ball of this magnitude. The central core of catgut undergoes gradual absorption, and the silk ball remains with some degree of suppleness. The method of introducing it recommended by M. Bourgeois is to dissect back the conjunctiva and raise the tendon of each rectus muscle on a hook. A needle, armed with a thread, is passed through each tendon, and, thus secured, it is divided. The globe is then removed. Traction on the threads by assistants displays a deep pit, the interior of which is cleared from clots, whilst hæmorrhage is prevented by the application of small pledgets of lint impregnated with mercury cyanide; the flow of blood having ceased, the ball, which has previously been rendered completely aseptic, is inserted, and rendered subcutaneous by drawing the margins of the conjunctiva together.

7. Myopia.

F. Otto (*Archiv. für Ophthalmologie*, Band xliii., Lief. ii. and iii.) gives the results of eighty-five cases of high myopia operated on by the method of discission by Prof. Sattler in Leipsic. He does not consider the objection that has been raised to the operation—that it leads to detachment of the retina—has any weight, since detachment is not infrequent in high degrees of this affection. It occurred in four out of the eighty-five cases, but only one seemed to be connected with the operation: one occurring fourteen weeks afterwards, another ten weeks, whilst a third was consequent on a blow. The suppression of accommodation which follows the extraction he holds to be of little consequence. Hæmorrhage in or on the retina occurred in only two cases. He has made careful examination of myopic eyes, and finds that the dioptric value of both the lens and of the media is the same as in normal eyes, and that the curvature of the cornea is not materially altered; hence he arrives at the conclusion that the condition of myopia is, as is generally accepted, essentially due to

the elongation of the globe in the antero-posterior direction. So far as regards the results obtained, they were as follows:—In seven cases the sharpness of vision was unchanged; in eight cases there was only trifling improvement; in eleven cases it was improved in the proportion of 4 to 3; in thirteen cases in the proportion of 3 to 2; in twenty-three cases in the proportion of 4 to 2; in six cases in the proportion of 5 to 2; in four cases it was reduced. Otto thinks advantage is gained by operating on both eyes. The operation performed was needling, with subsequent removal of the lens by a linear operation.

8. Cornea.

The operation of tattooing the cornea may be undertaken either for the concealment of a defect, that is, on purely æsthetic grounds, or for the purpose of diminishing the diffusion of light and enabling the patient to obtain sharper and more definite images, that is, for optical reasons.

M. de Wecker (*Annales d'Oculistique*, t. cxviii., p. 88, 1897), in an article devoted to this subject, dwells upon the importance of tattooing from the latter point of view, the improvement of vision. The tattooing of the cornea is not a modern operation, but was practised by the ancients, though neglected until reintroduced about 1870 by M. A. de Wecker. It is not to be despised, even for the removal of a blemish, since defects of this kind, besides often exposing the subjects of them to ridicule, keenly felt in youth, may at a more advanced age seriously interfere with engagements and occupation. But it is as a means of improving vision that M. A. de Wecker advocates its adoption. In many cases, where iridectomy has been performed for central opacity of the cornea, the operator is surprised at the small improvement in vision that results, notwithstanding that the new pupil is a good one and opposite a clear part of the cornea, and that any error of refraction is carefully compensated. In such cases there are often patches of haziness, and when these, by tattooing, are prevented from transmitting light the sharpness of vision may sometimes be observed to increase from one-sixth to one-third, or even two-thirds, of normal vision. A single needle should be used, the opacity, or cloudiness, very distinctly defined by a series of punctures, and the fluid employed should be ordinary Indian ink, rubbed down with a weak solution of perchloride of mercury, the excess being washed away with a solution of boric acid. He discards the fasciculus of needles altogether, believing that only one or two make a puncture when pressed against the cornea. The cornea should, of course, be rendered insensitive by means of cocaine.

Another method of tattooing has been practised by **Prof. C. Fröhlich**, which consists in the use, after the previous instillation of cocaine, of a small trephine, known as v. Hippel's trephine (Zehender's *Klinische Monatsblätter*, Jahrgang xxxv., September, 1897, p. 303). The depth to which this is made to penetrate depends on the consistence of the cornea, but should not, in any case, be great. This proceeding very precisely limits the part to be rendered opaque, and makes it perfectly circular in form. The epithelial layer within the circular area is now scraped off with a sharp-edged curette, and the exposed surface of the cornea cross-hatched with the point of a Graefe's knife. Any bleeding that may occur is suppressed with a stream of cold water. When this has ceased the colouring material is rubbed into the surface with a spoon. The eyelids should then be closed, and after a short interval reopened, so that any points which have escaped coloration may be retouched.

The causes of ulceration of the cornea are numerous, but in a short article contained in the *Ophthalmic Record* for July, 1897, p. 351, **Frank Edsall** draws particular attention to the coincidence of this affection with irritating discharge from the nostrils, causing an eczematous condition of the skin above the nose, and he has been successful in curing the ulceration by an alkaline spray. He also thinks that ulceration of the cornea is associated with errors of refraction, the mechanism being, in his opinion, interference with the trophic influence of the nervous system in consequence of over-stimulation of the nerve supply to that part, and to disturbance of the circulation. He cites an obstinate case of ulceration, in which recovery followed the employment of a - 0·75 D cylinder for the relief of myopic astigmatism.

Clarence Veasey (*Therapeutic Gaz.*, July 15, 1897) says the treatment of complicated ulcers of the cornea is at all times difficult, and the results are uncertain, and the judgment and skill of the practitioner, however great they may be, are not always competent to effect a cure. It is important, in the first instance, to remove all predisposing causes of disease, and hence in the young, change of air often leads to recovery, especially when such change is accompanied by marked alterations in diet. The local remedies which may be tried with advantage are thus enumerated by Clarence Veasey:—Moist heat, applied by means of fragments of cotton wool dipped in water at about 120° F., and replaced every two or three minutes with fresh pads at the same temperature for a quarter of an hour or more three times daily. Cleansing solutions of boric acid or of mercuric chloride or mercury cyanide, chlorine water or permanganate of potash or formaldehyde. The

latter drug he uses in the strength of 1 part to 4,000 of water, finding it especially useful in corneal ulcers having a tendency to spread, and complicated with hypopyon. The solution should be previously warmed. Then either atropine, 4 grs. to the ounce, may be tried if the ulcer be near the centre of the cornea, or eserine solution of the strength of $\frac{1}{6}$ gr. to $\frac{1}{4}$ gr. if the ulcer be near the margin. In bad cases *curettement* may be practised, preceded by the instillation of cocaine and a drop of a 2 per cent. solution of fluorescin, which colours the ulcerated portion light green, the part requiring cleansing by the curette being thus accurately mapped out; the process of curetting should be followed by dusting some iodoform over the surface laid bare. The cleansing may be effected by a fine jet of water instead of the instrument. Amongst the chemical agents that are sometimes efficient are nitrate of silver in solution, containing 10 to 30 grs. to the ounce, liquid carbolic acid, and strong solutions of bichloride of mercury, as, for example, 1 to 500. In all instances the application of these caustics should be executed with care and precision, the ulcer itself being the only part touched, or the most serious results may follow, and this is as a rule to be still more carefully attended to when the actual cautery is employed. In many instances, and especially in those where there is a considerable discharge of mucus or of puriform mucus from the nose, intranasal treatment must be undertaken. Veasey uses a weak alkaline solution followed by the insufflation of a powder containing pulverised camphor 30 grs., pulverised aristol 10 grs., pulverised menthol 20 grs., and bismuth subcarbonate 120 grs. If the mucous membrane over the turbinate bones be much swollen, it should be sprayed with a solution of antipyrin containing from 10 to 30 grs. in the ounce, the parts then cleansed with the alkaline solution, and this followed by the spray of such an oily preparation as the following:—Pulverised camphor 30 grs., pulverised menthol 30 gr., liq. petroleum 1 fluid oz. The topical use of the compound tincture of benzoin has also, he remarks been found of service in these cases. Lastly, the greatest attention should be paid to the constitutional treatment.

It is well known that the ointment of the yellow oxide of mercury, as usually made with vaseline or lanolin, if exposed to the light undergoes decomposition, becoming discoloured with precipitation of mercury in the form of a fine dust. The change does not occur if it be kept in the dark. **Wm. Babcock** (*Ophthalmic Record*, Aug. 1897, p. 421) calls attention to an old and almost forgotten mode of making up the ointment, which he believes prevents decomposition. The formula he gives is English graphite 10 grs.,

yellow oxide of mercury from 20 to 40 grs., theobroma oil ½ oz., butter of antimony 2 drops. These constituents should be mixed, and made into pencils. Any bland oil may be used as a substitute for the butter of antimony. The graphite prevents the action of light on the oxide of mercury, and with the oil prevents the falling of the oxide to the bottom of the vessel. The sticks into which the compound may be made should be applied lightly to the inner surface of the lid, and the eyelids closed for a few seconds.

9. Galvano-cautery.

M. A. Trousseau (*Recueil d'Ophtalmologie,* May, 1897, p. 249) records several cases in which the application of the galvano-cautery to a protrusion of the iris, consecutive upon an operation for the extraction of cataract, was followed by serious results: in two cases sympathetic ophthalmia supervening, and in a third case pupillitis. In all these cases the impairment of vision in the secondarily affected eye was considerable. From a study of these cases, he arrived at the conclusion that the use of the galvano-cautery can neither prevent nor effect a cure of sympathetic ophthalmia, but that it may itself induce an attack. He coincides with the dictum of M. de Wecker, that an injured eye does not set up sympathetic ophthalmia, but that sympathetic ophthalmia often follows and is caused by the operations intended to relieve conditions that have been established by the original injury.

10. Skiascopy disc.

A simple skiascopy disc has been devised by **S. Mitchell**, of New York, in which a number of plus and minus lenses are inserted into apertures near the edge of a disc, the number being marked conspicuously. The turning of the disc is entrusted to the patient, who is seated behind it with a good light over his head (*The Ophthalmic Record,* No. 2, vol. vi., p. 55).

Lens.

The precise situation of opacities near the posterior pole of the lens, can, it has been pointed out by **Edward Jackson**, of Philadelphia (*The Ophthalmic Record,* No. 2, vol. vi., p. 58), be determined by attention directed to the centre of curvature of the cornea. This is recognised by the bright reflection of the lamp flame from the corneal surface, which corresponds to a normal or radius of the cornea. As the surgeon moves his eye along any of the meridians of the patient's eye the reflex seems to move across the pupil, its rate and extent of movement being the same as the rate and extent of movement of an opacity situated at the centre of curvature of the cornea. Any opacity situated

in front of this would appear to move across the pupil more slowly than the corneal reflex, and any opacity situated behind the centre of curvature of the cornea would move across the pupil more rapidly than the reflex. The average radius of curvature of the cornea is about 7·8 mm.

The subconjunctival luxation of the crystalline lens is an event of not infrequent occurrence, as a result of blows upon the globe of the eye. The wound is generally situated in the upper part of the ciliary region, and leads to loss of vision. It is prudent in most instances to remove the eye which has been thus injured; if left, atrophy usually supervenes and there is some risk of the establishment of sympathetic irritation, or of sympathetic ophthalmia in the uninjured eye. **Mitvalsky**, of Prague (*Archives d'Ophtalmologie*, t. xvii., No. 6, June, 1897, p. 337), records thirteen cases of this accident that have fallen under his notice, and draws some practical conclusions from them. As a rule, the luxation is complete; but it is occasionally incomplete, notwithstanding that the extent of the wound is more than sufficient to allow the lens to escape. In by far the larger number of cases the lens is accompanied by the capsule, which, however, may not be entire but may present a rent of variable size. In one case it was observed that, after the lapse of fourteen weeks, when the division of the conjunctiva was made it was followed by the escape of a clear fluid due to the discharge of the contents of the anterior chamber of the eye, only the nucleus remaining in the sac of the capsule. In this case he was of opinion that he was dealing with a case of subconjunctival cyst, contained in the capsule, which was in direct communication with the anterior chamber. In cases of complete subconjunctival luxation, the lens undergoes changes that differ from those which occur when it is merely luxated within the globe. Its movements in the former case excite inflammation which solders the capsule to the adjoining connective tissue, whilst no inflammation is set up in the latter case, its lens being surrounded and embedded in its normal or physiological medium. The lens in subconjunctival luxation undergoes both regressive and progressive changes, the cortex and nucleus undergo regressive changes, whilst the epithelium of the anterior capsule undergoes progressive evolution. The hyaline capsule remains unchanged, apart from the formation of some vessels which traverse it to reach the products of the proliferation of the capsular epithelium. The lens in the first instance swells up in consequence of a dropsical degeneration of the cortical portion, but the fibres do not become opaque as in cataract. They resemble slightly cloudy gelatine, and this degeneration proceeds slowly from the outer part towards the

nucleus which is long before it undergoes complete liquefaction. The lens changes its form, becoming concavo-convex. The wound if small may heal, leaving only a dark stria to mark its former position, but usually some bulging or ectasia of a crescentic form remains, whilst complete healing may not take place for some months. As a result of the ectasia, there is more or less astigmia present. Amongst the thirteen cases observed by Dr. Mitvalsky only three retained imperfect vision, the vision of the rest was lost. In two of the three cases, the vision was 1 – 60 and in the third 6 – 60. He counsels removal of the lens as soon as the extravasation is so reduced in quantity as to enable its position to be determined, and sutures may, if requisite, be applied to the edges of the wound in the sclerotic. In support of this procedure, it may be remarked that a case was admitted into St. Bartholomew's Hospital in which a cabdriver, who had lost one eye, received an injury in the other which under ordinary circumstances would have led to its immediate removal, as the rupture was extensive and the intra-ocular hæmorrhage abundant, whilst the globe was collapsed. Sutures were carefully applied, union took place, the globe refilled, and vision was sufficiently good to enable the patient to walk through the streets without assistance.

11. Strabismus.

Amongst the various methods of treating strabismus that by **Prentice** (*New York Med. Journ.*, July 24, 1897) may be mentioned, who proposes in those cases where it depends upon or accompanies hypermetropia to overcome the spasm of the ciliary muscle, and the associated action of the internal recti by the use of strong convex lenses, with, in some cases, the addition of prisms. Experiment has satisfied him that by these means, after the lapse of some weeks, more complete relaxation of the ciliary and internal recti muscles is obtained than by the instillation of atropine.

12. Lachrymal sac.

At a meeting of the Ophthalmological Society of Paris (*Annales d'Oculistique*, August, 1897, p. 110), **M. Boucheron** presented to the members a man who had been subject to recurrences of inflammation and suppuration of the lachrymal sac and its surroundings. He was treated by the injection of the anti-streptococcic serum of Marmorek. This had caused absorption, and so modified the secreting and suppurating surface that no further production of pus was observed. The contraction of the nasal duct and the dilatation of the sac alone remained to be treated by other means.

13. Ptosis.

In cases of incomplete ptosis it has been customary to remove an elliptical portion of skin from the lid, with some of the subjacent fibres of the orbicularis muscle. When the ptosis is more marked the levator palpebræ superioris tendon may be advanced, a still better effect being obtained by the removal of two or three millimetres of the tarsus. In cases of complete ptosis, when the lid completely covers the pupil and the patient can only see by throwing the head back and bringing the frontalis into action, good results have been obtained by utilizing and advancing the frontal muscle; but **M. A. Darier** (*Annales d'Oculistique*, t. cxviii., p. 93, 1897), in discussing this subject, recommends that the muscular fibres of the orbicularis might be used, and suggests the following proceeding:—The lid is well stretched on the ivory spoon or elevator; an oval piece of skin, 3 millimetres in width, is removed from the whole length of the upper lid, care being taken to preserve the fibres of the orbicularis. Two bands of this muscle are then detached, except at their bases, which are situated at a little distance from each other and near the margin of the lid. A horizontal incision, 2 centimetres in length, is now made in the eyebrow, and the skin below the eyebrow is carefully separated till the first cut is reached; the two bands of muscular fibres are then brought up through the tunnel thus formed and attached to the upper border of the superciliary wound; the base of the muscular band is divided and attached to the inferior border of the ciliary wound; the edges of the wounds are finally united by a few sutures. The result, he states, is highly satisfactory.

14. Exophthalmia.

The occasional failure of operations upon the thyroid gland, undertaken for the relief or cure of exophthalmic goître, has led **M. Jaboulay**, of Lyons (*Bulletin de l'Académie de Médecine*, 22 July, 1897), to act upon the cervical sympathetic. He records a case in which, the usual symptoms being present, in a young man, he exposed the thyroid to the air for some time on two occasions; then, a year subsequently, practised ablation of the right lobe, and some months again afterwards removal of the left lobe, and yet the patient still suffered from palpitation and trembling, and the exophthalmia had not receded. He now determined to divide the sympathetic and make the section between the superior and middle cervical ganglia. No great improvement followed, except that the vision was better, but the absence of the usual signs was, he thought, due to some anomaly in the arrangement of the sympathetic, and was an indication for further

operation on the sympathetic. After the section the conjunctival vessels became congested, but simultaneously the prooptosis diminished. The subject deserves further investigation.

In the discussion which followed the reading of the above **M. Doyen** gave the details of his operations on two women affected with exophthalmic goître, on whom he performed the operation of ablation of the thyroid, nearly the whole of the gland being removed. The effects of the operation were in both instances most satisfactory, all the symptoms disappearing immediately and permanently. He was opposed to any interference with the sympathetic.

DISEASES OF THE EAR.

By George P. Field, M.R.C.S.,

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Consilerable difficulty has been experienced in past years, when reviewing recent contributions bearing on the treatment of aural disease, in rendering even a moderate proportion of this section of use and interest to the general practitioner, and there has been some justice in the criticisms which have come from more than one quarter that this article has been largely devoted to methods of treatment which are only carried out by experts. This difficulty again confronts the writer, who is compelled to take stock of *all* recent work and make such selections as appear to be desirable, but it is obvious that modifications and improvements in treatment will largely apply to measures of a surgical character with which only a minority of readers—viz. those who have taken out a course of aural surgery—are at present familiar; so that much of this article will again be unprofitable reading to all except younger men and those older practitioners who have acquired a practical knowledge of this important subject.

1. The treatment of boils in the external auditory meatus.

It is becoming more than ever evident that the *fons et origo* of this painful malady, as well as of acute middle-ear suppuration, is frequently to be found in bad sanitation and exposure to sewer gas.

Some tact and resolution may be necessary in pressing for an inquiry into this important matter; indeed, some persons seem to resent almost as a personal affront any hint that the sanitary arrangements of a house which they inhabit are otherwise than perfect. My belief, as above expressed, has been specially strengthened lately by a series of cases from Bombay and Burma in which foulness of atmosphere and unhealthy surroundings could be easily traced. As an application for the relief

of the pain which is to be attributed to pressure of the circumscribed abscess on the opposite hard wall of the meatus there is, in my experience, nothing better than *glycerine*. This acts by relieving tension, and it should be mixed with an equal quantity of tincture of opium and some boracic acid applied hot on wool. The operative treatment necessary is incision, which must be deep in order to obviate recurrence of the boil on the tragus or other parts of the ear. I have had renewed evidence recently of the efficacy of *yeast* internally as a remedy for furuncle. A patient of mine who is particularly susceptible to attacks of boils in the meatus finds that a tablespoonful of yeast after breakfast, attention to diet, and the local application of borax, is invariably efficacious in getting rid of them. There is much room for speculation as to the manner in which yeast thus assists in effecting a cure. It is certain, however, that diabetics, whose blood is charged with sugar, are peculiarly susceptible to boils and furuncles, and so are people who eat much sugar in their food. Consequently it is not unreasonable to suppose that since yeast carries on some of its fermentative processes in the stomach, its use as a remedy may be attributable to its destruction of sugar in the food ingested ; or possibly an explanation may be found in an antitoxic effect attributable to the introduction into the blood of certain by-products of the processes of fermentation.

2. The surgery of aural disease in children has received special attention both in England and on the Continent during the past year. In a paper read at a meeting of the South-Eastern Branch of the British Medical Association (*Brit. Med. Journ.*, June 12, 1897), I have endeavoured to show that a great deal of infant life is sacrificed or endangered every year by the neglect to perform an early paracentesis of the drum membrane in those frequent cases of acute otitis media which simulate posterior basic meningitis. This subject is such an important one that I think it will be advantageous to the reader if I here repeat the views which have been expressed by Cheadle, Lees, and Barlow with reference to it; I allude especially to the difficulty of differentiating between acute otitis media and non-tuberculous meningitis of children, and the importance of puncturing the drum-head in every doubtful case. Cheadle states that he has seen young patients presenting acute symptoms closely resembling posterior basic meningitis who have been quickly relieved and have got well after puncture of the drum membrane and a free discharge of purulent matter. But relief to symptoms has not always depended upon the escape of pus, for in one instance grave symptoms ceased immediately after the

operation, although there was not, at the time or afterwards, any apparent discharge. In another case, a child a year old had screamed violently, and almost incessantly, for a fortnight; there was clearly the most acute suffering, but the medical man who had had charge of the case could discover no cause for it. Although there were no outward signs of pain, the recollection of a similar instance in which pus had been evacuated by paracentesis with complete relief to symptoms induced Cheadle to solve the question as to median otitis by requesting me to puncture the drum membrane. The result in this case was complete relief and peaceful sleep immediately afterwards. **Barlow** and **Lees** have enlarged rather more upon the physical features of the cases which derive such signal benefit from incision of both membranes. They believe that the earliest symptoms compatible with a diagnosis of slight or well-marked posterior basic meningitis are retraction of the head—the most important of all—fever, extreme irritability, vomiting, and convulsions. Sometimes the head is turned to one side, obvious signs of pain in the ear may or may not be present; the fontanelle may be tense. If unrelieved by the treatment indicated, renewed cervical opisthotonos, tonic spasms of the limbs, hydrocephalus and death gradually supervene. The frequency with which otitis in young infants may thus infect the cerebral membranes is owing to the incomplete development of the temporal bone in the first years of life; the mischief originates most probably in infective catarrhs of the mouth and upper air passages.

J. H. Marsh published a paper in the *Brit. Med. Journ.*, July 24, 1897, on the treatment of suppurative otitis in young infants when the symptoms point definitely to the ear and should receive due recognition if the organ be properly examined for suppurative discharge. In two out of three cases he describes, the *abdomen* had been carefully poulticed and teething powders administered, under medical direction. The early symptoms of otitis media in the infant are enumerated by J. H. Marsh as follows:—(1) The child constantly endeavours to rub the affected ear. (2) It utters a sharp cry of pain on pressure being made below the meatus. (3) It refuses to rest its head on the affected side. This author recognises the close similarity these cases occasionally bear to meningitis, but he apparently waits for signs of a bulging membrane before performing paracentesis.

In treating suppuration of the attic, Marsh employed acetanilide with advantage. Izal lotion having been used in the first instance as a cleansing injection, the ear was dried with iodoform wool, after which a few crystals of acetanilide were

insufflated. The cavity was thereby kept sweet and the amount of discharge reduced.

3. The "radical" operation for caries of the temporal bone in children has recently been performed and described in Germany by **Panzer** (*Proc. of Austr. Otol. Soc.*, translated in *Journ. of Lar.*, Oct., 1897). In chronic cases he practises the typical operation devised by **Küster, Bergmann,** and **Stacke,** and in the acute ones he follows no fixed rule, but is guided by what he finds at the time. In regard to the method of dealing with the meatus, he prefers to cut away the postero-superior wall of the membrano cartilaginous meatus, a plan which neither interferes with healing nor induces necrosis of the exposed bone. The after-treatment consists in plugging the cavity of the wound two or three times a week with iodoform gauze, and cauterising with chromic acid any granulations that appear ultimately. An endeavour was always made to close the fistula behind the ear. Discussion turned upon the question of operating *versus* conservative methods. **Gruber** thought that, owing to the looseness of the junction of the various elements of the temporal bone in early life, inflammation extended more easily inwards than outwards, and that consequently suppurative otitis was not nearly so dangerous in infancy as after the age of puberty; he therefore hesitated to recommend radical methods in children. Another point was the advisability of operating in tuberculous cases. **Kaufmann** thought these did better under general treatment, healing of the operation wounds being slow and wearisome. The prevailing opinion, however, was in favour of early operations, tardy recoveries being in reality due to a too long delay in having recourse to surgical interference.

Cozzolino has taken up this subject in Italy (*Gazz. Med. di Roma*, 1896). He insists on the absolute necessity of examining the ears of children and infants presenting vague febrile symptoms with or without indications of meningitis. He meets the difficulty of describing border cases of doubtful diagnosis by supplying the term "pseudo-meningo-cerebral syndroma" or "meningism" as expressing a condition so often accompanying exudative otitis media. It may be here remarked that Cozzolino adopts exclusively for children the antiseptic gauze dressings of Hamon du Fougeray, and rejects liquid injections and syringing altogether. As regards operation, he has recourse to it early and unhesitatingly, and on this principle has met with the happiest results.

4. The treatment of chronic dry catarrh.

Garnault has published a work (*see* "New Publications," p. 399) in defence of intra-tympanic surgical intervention in all

cases of deafness and tinnitus arising from disease of the conducting organs, and when all the simpler traditional methods have been exhausted. His endeavours deserve attention and encouragement in view of the apparent hopelessness of treating confirmed deafness from this cause in the present state of our knowledge. The Austrian otologists have discussed the utility of injecting sterilised vaseline through a puncture in the membrana tympani. **Kaufmann** (*Journal of Lar.*, Aug., 1897), having met with unfavourable results in a case of sclerosis, advocated the abandonment of injections in this form of chronic catarrh. It is, however, apparent to those following the discussion, that there was considerable disagreement amongst the speakers as to the pathology and differentiation of sclerosis. Politzer, from his recent dissections, describes this disease as a special inflammatory thickening of the labyrinth wall surrounding the fenestræ. Gruber, on the other hand, whilst recognising this thickening, looks upon it as one of the general results of chronic hyperplastic inflammation, producing secondary new growth of bone by extension through the muco-periosteal lining. The general consensus of opinion was in favour of the injections, the chief object being to maintain a permanent opening in the membrana tympani.

5. Post-influenzal otitis media is characterised by the rapidity of the inflammatory process, and the early stage at which perforation of the membrane takes place. Immense quantities of discharge, at first sero-sanguineous and subsequently purulent, continue in many cases to pour out for days, and even weeks. I have always found simple treatment and absence of heroic measures to answer best in these cases. Attempting to check the discharge by filling the meatus with dry powders may lead to very serious brain symptoms. The same may be said of the employment of strong lotions. The plan I adopt, if there be acute inflammation and severe pain, is to leech repeatedly till all suffering has subsided, and to syringe the ear very gently six times a day with a solution of potassium permanganate in water, increasing the strength of the lotions employed as the discharge lessens. For healing the perforation, I have found the application of nitrate of silver to the edges to be the most promising method of treatment. A solution of 15 grs. to the ounce is applied by means of cotton-wool twisted on a fine probe.

6. Attempts at closure of old perforations of the drum membrane have been recently revived by **Gompertz** (*Wien. klin. Woch.*, No. 38, 1896), who has followed Okuneff's recommendations successfully. The method consists in cauterising with

trichloracetic acid, and after a prolonged treatment, extending over eight or ten months' cicatrisations have been obtained. Gompertz begins by carefully cleansing the surface and packing with 10 per cent. solution of cocaine. He then applies a fine probe tipped with cotton-wool and charged with trichloracetic acid to the borders of the perforation. Six cases out of ten cicatrised in about ten months time, the remaining four were giving indications of healing in like manner. It is stated that the new tissue actually contains a regeneration of the membrana propria of the drum membrane, and that it is impossible to discern the line of junction of the old membrane with the new. Gompertz states that he has obtained complete closure of the perforation when less than half the membrane remained. The principal gain to the patient by such brilliant results is not so much a commensurate improvement in hearing—for this does not necessarily follow—as protection from the entrance of septic organisms from without, and from the pernicious effects of continued suppuration. I do not think, however, that many patients in England, either hospital or private, will be found whose capacity for endurance and perseverance will admit of such lengthened treatment. Another method in vogue for closing perforations, which has lately been extolled by **Barclay**, is that of Blake, by means of sized writing paper, especially in the treatment of recent traumatic apertures. A circular disc of paper overlapping the edges is carried to the hole by means of a cotton holder, pressed into apposition and left there for about a week.

7. Treatment of acute median otitis.

Hopkinson publishes a note in the *Journal of the American Med. Association* (Feb. 27, 1897) advocating frequent syringing of the meatus with a solution of perchloride of mercury (1 in 1,000) as hot as can be borne for the relief of pain; in addition, he produces free diaphoresis by administering a quarter of a grain of pilocarpin twice daily. He also advocates the use of inflation by Politzer's bag in acute inflammation. This practice has been almost altogether abandoned in Great Britain on account of the frequent increase of pain and on bacteriological grounds; if inflation is employed, a clean catheter is much to be preferred to the use of the bag.

8. The treatment of deafness due to non-suppurative tympanic lesions, the result of catarrhal and suppurative inflammations, by digestive ferments (*Arch. of Otol.*, April, 1897).

The introduction of ferments (*e.g.* papain) into the middle ear for the purpose of clearing up suppurative and other products of

inflammation, has been practised for some considerable time, but to **Cohen-Kysper** is due the credit of the suggestion to get rid of the residual bonds and adhesions in suppurative and non-suppurative inflammations after all discharge has ceased. The object is to render the conduction of sound more easy by dissolving and reducing in size hyperplastic material as well as connective products, which, by hampering the action of the ossicles, are such a common cause of deafness in these cases. It has been proved by experiment that the various forms of epithelium, as well as connective and elastic tissue, are capable of being dissolved by the digestive ferments, particularly pepsine. Living rabbits' ears and frogs' legs introduced into dogs' stomachs through gastric fistulæ have been thus completely digested. The cavity of the middle ear being surrounded by rigid walls, and the materials to be acted on being the result of defective processes of circulation and nutrition, favourable conditions present themselves for the lengthened action of a solvent fluid. After testing various ferments, Cohen-Kysper, profiting by the experiments of **Klug** on pepsine digestion, made a choice of dogs' pepsine, which in from twenty to forty minutes can perform work which would occupy the pepsine of cattle or swine four hours. Klug discovered that the best action of pepsine was obtained from weak solutions, and Cohen-Kysper accordingly found that the most suitable proportion for dogs' pepsine was 1 in 10,000. It must be chemically pure, and must be previously passed through a bacteria filter. The proportion of hydrochloric acid should be ·15 per cent. The instrument employed for making the injections is a Koch syringe, modified to meet the necessary requirements of an ear instrument. The cannula is bent at an angle, the needle towards the point is as thin as possible, and the bevel is short. A piece of rubber tubing between the bulb and glass cylinder is indispensable to steady and safe handling. The bulb should be compressed by an assistant, who should watch the flow of the solution, in order that the air following does not drive the fluid out of the tympanum.

The injection is to be made as near as possible to the stapes—that is, posteriorly to the manubrium mallei in the vicinity of its upper half, or between the rim of the drum-head and the descending limb of the incus, if there be room enough. In this way the niche of the fenestra ovalis, with the stapes, will always be filled by the injection. If the drum-head is strongly retracted and the posterior fold prominent, one may make the puncture at this latter point. The fluid sometimes escapes into the throat by the patulous Eustachian tube, but sufficient remains in the

spaces about the stapes even if the cavity of the tympanum be empty.

The amount of fluid to be injected is from two to three decigrammes (three to five minims) previously warmed. The patient may conveniently lie with his head turned to the opposite side, on a pillow, in which position he should remain about an hour. The first injection should be made successfully if possible, for, should it fail, a repetition cannot safely take place before the lapse of several months, owing to the danger of producing irritation. To prevent hæmorrhage, the descending strip of cutis from the upper wall of the meatus which carries the large vessels should be avoided. The use of an anæsthetic is often advisable, as the pain is sometimes severe. When suppuration has ceased, and a perforation exists, the procedure is very simple. In complete absence of the drum-head, or when there is a large perforation, it is sufficient to instil just enough drops to fill the cavity, a plug of cotton is then placed in the meatus, and the patient maintains the recumbent posture for an hour.

The same procedure is adopted in total adhesion of the drum-head when puncture is impossible.

Thus carried out, this treatment is alleged to have been so far very successful; in suitable cases the hearing improves fivefold immediately after the injection, and is retained. All the result possible is usually reached within half an hour or an hour, and hence one may infer that very small particles of tissue have been the interfering causes in the conduction of sound. These are cases in which the solution comes in contact with cicatricial tissue, an actual digestion of which takes place—the stapes being embedded in a cicatricial membrane, and the mucosa is completely covered with epidermis. In chronic non-suppurative catarrh acute irritation of the drum-head sometimes develops, but this does not appear to interfere with a definite result either as regards improvement in hearing or in the subjective sounds when these are present. This result is usually apparent on the day following the injection, and improves with the gradual disappearance of the symptoms of irritation; the earlier it appears, the better the prognosis. The treatment is only suitable in cases in which hypertrophic processes and connective tissue formations have affected especially the niches of the fenestræ and the stapedial connections, not in sclerosis, bone disease, ankylosis of the ossicles, or labyrinthine disease. It is only indicated, in fact, when whispered speech is still heard near the ear, and when the effects of the catheter have been exhausted or found to be useless. A total of 150 cases of these forms of chronic catarrh

were treated, of which forty were bilateral. Eighty cases were treated with injections of pepsine solutions. In the remainder other ferments were used. The number improved was more than two-thirds of the total number in each instance.

As regards the residue of suppurative inflammation of the middle ear, forty-five cases were treated and two-thirds were benefited. In spite of the more than encouraging results claimed for this treatment, it is significant that Cohen-Kysper emphasises the fact that this procedure must yet be regarded in the light of a therapeutic experiment. It will doubtless be given a fair trial by experts in Great Britain and abroad.

9. The treatment of deafness arising from the residue of chronic suppurative inflammation, according to **Dundas Grant** (*Clin. Journal*, Dec. 23, 1896), resolves itself into two elements—first the liberation of the stapes, and secondly the application of a substitute for the tympanic apparatus. In order to free the stapes, it is necessary, in the first place, to restore the ventilation of the tympanum, if possible through the Eustachian tubes. Next comes the removal of all accumulations in the sacculated cavities, which is best done by means of an intra-tympanic syringe such as Milligan's. Granulations must also be got rid of and prevented from recurring. Alcohol drops, pure or diluted with glycerine, will best effect this. These means, combined with the use of an artificial drum about to be described, are often sufficient to create a satisfactory improvement; if not, certain surgical procedures may have to be performed, which consist in dividing any adventitious bands that are accessible to the knife. The likeliest and most frequent operation of this class is severing the posterior fold of the drum membrane when it is causing retention of masses of desquamative material which hamper the action of the stapes. Another consists in liberating the ossicles when fixed. The stapes may be freed by section through the incudo-stapedial joint with a rectangular knife, or through the limb of the incus with Politzer's scissors. Finally, complete excision of all three ossicles may be indicated when not only the stapes is impeded but exit of discharges or of cholesteatomata is prevented. Tenotomy of the tensor tympani may be performed in cases of antero-inferior perforation, in order to counteract the aggravated contraction of this muscle when due to absence of part of the normal antagonism of the fibres of the membrana propria; undue pressure on the stapes and vertigo and tinnitus being the consequence.

The next point is the selection of a suitable form of artificial *drum.* The following is the pattern which Dundas Grant has

found to give the best results:—A small wisp of long-fibred non-absorbent wool of about three-quarters of an inch in length is pulled out of the bundle. The extremities are trimmed off so that loose fibres are removed, and a fine thread is tied round the middle of the wisp. The fibres are then spread out in a radiating manner, so as to make a round pellet, and the peripheral extremities are turned in, so that a somewhat springy cushion is formed of about the size of a pearl shirt-button. The thread is held by means of a fine ear forceps, and the pellet, after it has been dipped in the liquid selected, is pushed through the meatus until it comes in contact with the tympanic membrane, or nearly so. A final adjustment is made with a probe, pressure being applied in an upward and backward direction, so as to press the pellet against the stapes. When it reaches the right spot, considerable improvement in hearing power sometimes takes place at once.

The "captive drum" should not be moistened with water, as this tends to keep up discharge or cause it to return. The best agent for the purpose is some aseptic oil, such as paroleine or benzoinol; moistening with a solution of cocaine is said to cause it to act better. The drum finds its best application in those cases in which the head of the stapes is exposed by a postero-superior perforation. If the latter is in the postero-inferior quadrant, a better effect is obtained by twisting up a long thin pellet of wool and introducing it *into* the perforation, so as to bulge upwards and approach or touch the stapes. Thin cicatrices over the stapes, when drawn in under atmospheric pressure, hamper that bone without conveying sonorous vibrations to it. The improvement that takes place on inflation soon disappears when the cicatrices become relaxed again. To tighten up these relaxed cicatrices there is nothing better than contractile collodion. This is painted on the cicatrix when the latter is blown out to its full extent, the brush being drawn on to the adjacent portion of the meatal wall. The layer may be left *in situ* for some weeks, or until a return of the deafness calls for further examination, or the loosening of the dry collodion necessitates its removal. It is questionable whether in many cases the cicatrix does not become permanently tighter. The modification of Yearsley's cotton-wool drum devised by Grant is no doubt very ingenious, although perhaps a little troublesome and time-consuming in the making. The idea of rendering it captive by attaching a thread which lies in the meatus is a good one, as the surgeon is thereby relieved from the fear of the drum being lost in the ear and forgotten—a fertile source of renewed deafness and

discharge. I have for a long while had excellent results from the use of the flat or long pellet moistened with glycerine and water, and agree with Grant that no one can make the final adjustment so well as the patient himself, who should always be provided with a suitable pair of forceps for applying and removing the pellet.

SEQUELÆ OF MIDDLE-EAR INFLAMMATION.

Perhaps the most interesting and most important of the many papers, clinical, statistical, and otherwise, that have been recently contributed to medical literature upon **mastoid operations,** is that by **Arbuthnot Lane** (*Clin. Journal*, Oct. 13, 1897). The paper is a summary of facts and conclusions resulting from a retrospective glance at the work done by him in this department during several years past, and the following are some of its principal embodiments: Lane adopts a plan of operating which, whilst differing greatly from that of Schwartze in detail, is nevertheless founded upon the same principles, and is, in fact, an extended application of them. In other words, in place of a simple *antrotomy* or exposure of the antrum through an opening not more than 15 millimetres across, this surgeon attempts, whenever possible, to extirpate or obliterate this cavity altogether, and it is with the express desire to indicate this endeavour that he originally adopted the term *antrectomy* in describing his operation. From the somewhat loose way in which the word "antrotomy" is made to serve by other operators who apparently aim at the same results and by similar methods, I doubt very much whether this fact is fully recognised by them. Lane insists that only in a small number of cases are the traditional mastoid cells of anatomical works found. Very many mastoid processes consist of dense bone, free from any but the smallest cancelli, which lie perhaps only in the apex. Such are the cases in which, when there is chronic purulent otitis, one meets with no tenderness or inflammation of the mastoid, but deep-seated pain in the side of the head, and perhaps also pain of the same character in the ear. The beneficial effect of antrectomy upon audition is seen in the restoration of normal hearing afterwards in cases of cholesteatomata, these accumulations having acted as buffers to sound whilst at the same time keeping up inflammatory irritation. In order to retain the improved condition resulting from the operation, it is necessary to replace the functions of both the antrum and membrana tympani; the principal office of the latter Lane believes to be the prevention of evaporation of the secretions of the middle ear and antrum. The first indication is effected by daily irrigation

and the introduction of a minute quantity of some antiseptic such as boro-glyceride, or a mixture of glycerine and iodoform; evaporation being prevented by placing in the meatus a small plug of lamb's wool. Deep-seated, enlarged antra, covered by $\frac{3}{4}$ of an inch or more of dense bone, are a source of great danger to the individual, and the pain which such patients suffer in the course of an invasion of the part from an otitis media, is due to an obvious chronic inflammation of the dura mater in immediate relation with it. Lane has made no alteration in the choice of instruments since the published accounts of his operations. He employs the gouge and mallet, and occasionally the drill (electro-motor), and speaks with the utmost contempt of the trephine for the purpose of exposing the antrum. On inquiry after the lapse of several years, and always understanding that the patient has taken the trouble to clean the ear daily and insert a plug of wool into the meatus, the results have been ascertained to be as follows: The improvement in hearing immediately after the operation has not only been retained, but has often become more acute. The patient has been absolutely freed from subsequent risk of intra-cranial complications, from foul discharge, headache, neuralgic pain, and tenderness. Existing facial paralysis has often been cured, the formation of aural polypi prevented, and, as already observed, almost perfect hearing restored.

An exhaustive and comprehensive paper upon mastoid operations is that by **Moure** (*Arch. Cliniques de Bordeaux*, Feb., 1897). It will suffice briefly to observe that Moure's plan of operating coincides essentially with that of Lubet-Barbon and Broca, following Schwartze, and in commencing to remove the bone he appears to be quite satisfied with the trephine. He likes this operation best in all cases in which there is reason to believe that the antrum occupies its normal position, as is the case in young subjects, and also when suppuration has followed cholesteatomata. The inconstant relationship of the lateral sinus is a drawback, but this vessel may easily be avoided. When once the antrum is opened a vast cavity is exposed, enabling the surgeon to reach the tympanum without difficulty, by way of the aditus, which is usually much exaggerated in size by suppuration, and is easy to find. Moure considers it essential that the surgeon should be equally familiar with Stacke's operation, and be prepared to adopt it when specially indicated.

Although **peroxide of hydrogen as a therapeutic agent in aural suppurations** has occasioned much unfavourable comment in Great Britain on account of its chemical instability, the fact remains that it is still employed in the

otological practice of many of the hospitals, and it has lately formed the subject of a discussion by the Austrian Otological Society (*Journal of Lar.*, Aug., 1897). The drug owes its efficacy, as everybody knows, to the rapid liberation of oxygen which takes place during its decomposition in the presence of alkaline liquids and organic secretions. **Politzer** recommends it firstly in *acute suppuration of the middle ear.* After syringing the meatus with warm sterilised water, he fills it with peroxide solution (3·6 per cent.), the head being inclined to the opposite side, and then practises inflation of the tympanum by his method. This treatment may be employed soon after the appearance of the discharge, and if no diminution takes place within a few days, recourse should be had to boric acid. Secondly, in *chronic suppuration*, a rapid diminution of the discharge is sometimes observed after several days' use of the peroxide, and in some cases it completely disappears. In others there is no special influence in this respect, but the remedy has been useful all the same in cleansing and disinfecting the parts; so that it should be employed first, especially in septic and neglected cases, and then, if necessary, the ordinary antiseptic treatment can be pursued afterwards. Thirdly, Politzer has found the drug useful in forms of *desquamative suppuration of the middle ear*, in which masses of epithelium are heaped up in the recesses of the tympanic cavity, and are therefore out of reach by the ordinary means. These concretions, and also the remains of cholesteatomata, are frequently brought to the surface during the rapid liberation of gas following the introduction of the peroxide. There is a general agreement amongst the Austrian otologists as to the unirritating character of the peroxide, and also as to its value in checking hæmorrhage.

The experiences of **Scheppegrell** in the use of the peroxide have not been so favourable. Having first experimented with oxygen gas in the treatment of suppurative processes of the ear and nose according to Stoker's method and met with negative results, he determined to devise some plan for procuring the gas in its *nascent* state (*Journ. of Lar.*, July, 1897). Trying first peroxide of hydrogen, he found it very irritating, inconvenient on account of the liquid which holds it in solution, and also expensive. Scheppegrell therefore commenced to employ the allotropic form of oxygen gas known as **ozone**, and the results obtained in the treatment of middle ear suppuration, and kindred diseases of the nose and accessory sinuses, he states to be very gratifying. As the data furnished in the paper referred to are *somewhat* meagre, it would be premature to form an opinion

upon them. Of the various methods of generating ozone, Scheppegrell found the simplest and most economical was that of direct extraction from the atmosphere by a process of electrification with an induction coil. The ozone thus obtained is diluted to the necessary degree, and the air required for its production can be pumped from the ordinary compressed air reservoir of the consulting-room.

CRANIO-AURAL SURGERY.

A great number of cases of operations upon the cranium to meet the complications of aural disease have been recorded during the past year. These reports include unsuccessful as well as successful operations, and our knowledge of this important branch has thus been much enriched. In a case of otitis media, under the care of **Gilbert Barling** (*Brit. Med. Journ.*, June 12, 1897), in which an abscess formed in the cerebellum, a hernia cerebelli as large as an orange followed evacuation of the pus, but receded under compression cautiously applied, and became cicatrised over in due course. With the disappearance of the hernia the general condition improved, and the patient made an excellent recovery.

Two cases, one by **Dench** and another by **Knapp**, of lepto-meningitis, that were presumably entering upon a fatal suppurative course but were cured by operation, are described in the *Journal of the American Otol. Assoc.*, July, 1896. Macewen collected and described twelve such cases in his well-known work, out of which six were treated and cured by operation. Dench opened the skull in his case immediately above the external auditory meatus, thus ignoring Macewen's rule always to open the antrum first, because, he explains, examination showed no obstacle to drainage through the meatus. The meninges were congested—the nearer the margin of the meatus was approached the greater being the congestion—until a free discharge of bloody serum took place. A probe passed along the tympanic roof detected slight roughness of the bone and let out still more serum. No pus was found in the brain substance, and the lateral sinus was not thrombosed. The infected area was isolated by inserting a tampon of iodoform gauze in the epidural space, and the patient got perfectly well. Dench observes that nature had made no effort to shut off the infected area in this case, and that therefore general meningeal inflammation must of necessity have followed in due course.

It has usually been the custom to divide this operation into two stages, with an interval of a few days between, chiefly in

order to avoid shock, but Dench prefers to make a large cutaneous incision in one operation, admitting an exploration of the middle cranial fossa, roof of the tympanum, posterior surface of the petrous bone (from one of which three centres infection usually takes place), and lateral sinus, as well as free access to the mastoid antrum. This incision takes a curve from just below the tip of the mastoid, parallel to the margin of the auricle, to a point half an inch behind the external angular process of the frontal bone. The semicircular flap thus formed is drawn downwards and forwards, carrying with it the auricle, and exposing the upper and posterior margin of the bony meatus and surface of the temporal bone above and in front of the ear. By drawing this forward, free access can be gained to the mastoid antrum and lateral sinus. Hæmorrhage is controlled by clamps which grasp the entire thickness of the flaps. In the absence of localising symptoms the region of election is immediately above and a little in front of the external auditory meatus. Dench prefers entering the cranium with a chisel, and enlarging the opening with rongeur forceps.

In the case that **Knapp** operated upon and described (*loc. cit.*), cerebral symptoms of a meningitic nature supervened upon the sudden stoppage of discharge from the meatus in a case of acute suppurative otitis media. The mastoid was opened, and a free communication established between the antrum and attic; the posterior and middle cranial fossæ were also exposed. The bone in front and behind the lateral sinus was removed, and the dura mater laid bare for two centimetres. This membrane was found to be smooth, cream-coloured, and in places somewhat red; there was no pus to be seen in the carious mastoid or cranial fossæ. No collapse followed the operation, and the temperature fell. The next day the dressings were blood-stained, and twenty-four hours later, when removed, were saturated with purulent discharge, greenish and offensive, which escaped from the mastoid wound. There was a good recovery in six weeks.

Bronner has opened and drained a temporo-sphenoidal abscess by a method which has an element of novelty in it—viz. through the **osseous auditory meatus** (*Brit. Med. Journ.*, Aug., 1897). The cerebral cavity was entered by removing with a chisel the roof of the osseous meatus, and by thence working upwards through the root of the zygomatic process. A large abscess cavity was found, presumably in the temporo-sphenoidal lobe, washed out and drained. The patient made a good recovery. Bronner speaks highly of this method, which he attributes mainly to Walton Browne. Perfect drainage is obtainable from below,

and the tube is easily and painlessly removed and replaced. In spite of the success in this instance the operation must be regarded as one of very exceptional applicability.

NEW PUBLICATIONS.

"Festschrift des Stuttgarter Aerztlichen Vereins," am 6 März, 1897. Containing several papers by various contributors on aural subjects.

"Short Contributions to Aural Surgery," by **Sir Wm. Dalby.** London: J. and R. Churchill. 1896. A third edition, with five additional papers.

"L'Oreille: I. Anatomie; II. Physiologie—Physiogénie et Méchanisme; III. Physiologie—les Fonctions." **P. Bonnier.** Paris: Masson et Cie.

"Manual of Diseases of the Ear, including those of the Nose and Throat in relation to the Ear," by **Thomas Barr.** Glasgow: Maclehose and Sons. 1896.

"Deafmutism," a Clinical and Pathological Study, by **James Kerr Love.** Glasgow: Maclehose and Sons. 1896.

"Manhattan Eye and Ear Hospital Reports," Jan., 1897. New York: Knickerbocker Press.

"Diseases of the Ear, Nose, Throat, and their Accessory Cavities," by **Seth Scott Bishop.** Philadelphia: The F. A. Davis Company. 1897.

"Le Traitement Chirurgical de la Surdité et des Bourdonnements." **P. Garnault.** Paris: A. Maloine, 1897.

NEW INSTRUMENTS.

A new drill for mastoid operations has been devised by **Blake** (described and figured in *Journal of the American Otological Society*, 1896). This drill is long and broad bladed, cutting at an obtuse, not an acute angle. It is rotated with one hand and held firmly with the other at a point so near the blade that a very slight deviation of the operating end is caused by a wide and easily appreciated movement of the handle.

A new rongeur forceps is figured in the same journal by **Gorham Bacon.** These are strong, have long handles, and are made in two sizes. They appear to be well adapted for the purpose intended—viz. the enlargement of trephine openings.

A set of gouges has been invented by **Ballance** for mastoid operations. These instruments are much heavier and more powerful than those in common use. The cutting edges are

square in outline, and the round handles and finger rests are a decided improvement as affording a better grasp.

Alderton, of Brooklyn, has invented an apparatus for entering the mastoid antrum mechanically. It consists of two separate portions which meet in the antrum by approaching each other through the external wall of the attic and mastoid bones respectively. The contrivance is figured and described (though not very lucidly) in the *Arch. of Otol.*, July, 1896. I have not heard of its having been employed in Great Britain, and, ingenious though it be, its essentially mechanical construction would debar me from using it.

An instrument which I think is more likely to meet with general favour is **Ballance's tympanic chisel** for **Stacke's** operation. It is intended for snipping through the bridge of bone between the antrum and attic, and will prove valuable in obviating concussion; also, if carefully used, in protecting the facial nerve in the aqueduct of Fallopius at this rather delicate stage of a mastoid operation.

Lake's double mastoid antrum guide. This is a combination of his right and left guides into one instrument. The edges of the footplate are also made blunter, and the curve is such that it fits into the aditus when the handle of the instrument is held parallel to the zygoma. (*Jour. of Lar.*, April, 1897.)

An improvement in **Simal's masseur**, also a direct masseur, and a hand vibrator for the membranæ tympani, have been made by **Gellé**.

DISEASES OF THE NOSE AND THROAT.

By StClair Thomson, M.D., M.R.C.P. Lond.,
F.R.C.S. Eng.,

Surgeon to the Royal Ear Hospital.

In this domain of practice there has been, fortunately, a decided diminution in the publication of plans of treatment which are based on inadequate reasons. On the other hand, increased attention has been given to pathology and to the methods of more exact diagnosis. Our resources in the way of clinical examination have been increased in many ways, and chiefly by the confirmed value of the Röntgen rays. The year has seen the rise and fall of the alleged cure of ozæna by the antitoxin of diphtheria, and the extravagant claims advanced for turbinotomy have been considerably curtailed. The good work done in Great Britain on the subject of laryngeal cancer is now becoming more widely recognised, and from all sides records are forthcoming of the excellent results obtainable by early diagnosis and treatment.

GENERAL METHODS.

Röntgen Ray Photography.—Further improvements and possibilities have been brought forward by **Macintyre** (*The Practitioner*, Jan., 1897) and **A. Scheier** (*Arch. Inter. de Laryng.*, No. 6, 1896). The great value of the Röntgen photography in cases of foreign bodies in the upper air- and food-passages continues to be demonstrated by the publication of numerous cases. It is of eminent service in suspected cases, when the history is indefinite and symptoms are absent. In two such cases, reported by **Howard Marsh**, a coin was readily localised in the œsophagus and easily removed by Bowlby's modification (Fig. 1) of the coin-catcher. (*Clin. Soc. Trans.*, xiii., 1897.)

Regnier and **Glover** claim that it is easy to see on the screen the transparency, and therefore the emptiness, of the frontal and

maxillary tissues, and that this method is much more exact than transillumination. (*Journ. des Praticiens*, No. 37, 1897.)

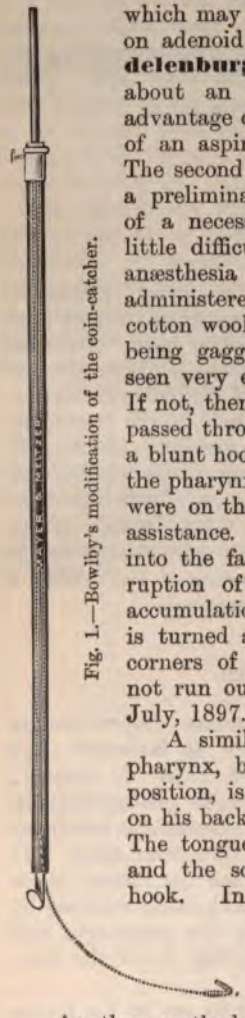

Fig. 1.—Bowlby's modification of the coin-catcher.

W. W. Keen calls attention to the great advantages which may be secured by operating on the tonsil and on adenoid growths in the pharynx in the **Trendelenburg position.** The patient is placed at about an angle of 35 to 45 degrees. The first advantage of this position is that there is little danger of an aspiration pneumonia following the operation. The second advantage is that we may generally avoid a preliminary tracheotomy, and with it the danger of a necessarily infected wound. Thirdly, there is little difficulty in giving the anæsthetic, which, once anæsthesia is established, should be only chloroform administered by means of a good-sized pledget of cotton wool held in ring forceps. Fourthly, the mouth being gagged open, the interior of its cavity can be seen very easily with the help of a tongue depressor. If not, then the tongue can be controlled by a ligature passed through it. The soft palate can be raised with a blunt hook, and adenoids removed from the vault of the pharynx with the aid of sight as plainly as if they were on the face. A forehead electric lamp is of great assistance. Fifthly, there is no spluttering of blood into the face of the operator, and therefore no interruption of the operation. There is also but little accumulation of blood in the mouth, for if the face is turned a little sidewise the blood runs out of the corners of the mouth very readily, and what does not run out can be sponged out. (*Annals of Surg.*, July, 1897.)

A similar method of directly inspecting the naso-pharynx, but without the use of the Trendelenburg position, is described by **Katzenstein.** The patient lies on his back with the head hanging as low as possible. The tongue is drawn forwards with a tongue cloth, and the soft palate is raised by means of a palate hook. In this way the Eustachian tubes can be directly inspected, as well as all structures lying in the naso-pharynx. The posterior choanæ, of course, still remain invisible. (*Archiv f. Laryng.*, Bd. v.)

Another method of directly inspecting the region of the *pharyngeal* tonsil has been imagined by **Lindt.** The patient is

seated at a higher level than the observer, and his head is tilted backwards. Reflected light is used while the palate is held out of the way by a palate hook, the handle of which is bent upwards at a slightly obtuse angle, not downwards. (*Archiv f. Laryng.*, Bd. vi., 1897.)

Thomas R. French has succeeded in taking **photographs of the larynx** and the post-nasal space by electric light, and so

Fig. 2.—Photograph of larynx showing singer's nodules.

Fig. 3.—Photograph of larynx in Fig. 2 after removal of growth.

Fig. 4.—Photograph of larynx of a patient affected with phthisis. There is impaired action of the internal tensors, and spasmodic contraction of the ventricular bands.

Fig. 5.—Photograph of normal larynx; quiet respiration.

dispensing with the uncertain rays of the sun. He employs a 2,000 candle-power lamp, reflecting the beam of light from a frontal mirror. The time needed to secure a photograph of any larynx does not exceed that necessary for making a careful laryngoscopic examination. For full details of the technique I must refer readers to the original publication (*N.Y. Med. Journ.* Jan. 23, 1897, and *Trans. Amer. Laryng. Assoc.*, 18th Congress

1896), but the success of the method may be judged from the examples given on p. 403. It should be borne in mind that the photographs have not received the slightest amount of retouching, and that they have lost considerably by the process of reproduction. Still, it would be difficult to surpass the excellence of Fig. 2, which shows two singer's nodules in the usual situation; the adjacent hyperæmia of the cords is well seen, and even the film of mucus which churns up when the nodules rub against one another in phonation and then stretches across the glottis as the cords separate on respiration. The growth was removed by French with tube forceps (it proved to be a simple inflammatory neoplasm), and Fig. 3 represents the appearance of the larynx after the operation. Fig. 4 shows the larynx in a case of tuberculosis, and Fig. 5 the normal larynx.*

A useful **wrist easel** has been designed by **Dundas Grant** with tracing tablets specially adapted for facilitating the drawing of the appearances found in cases of diseases of the throat and nose. (*Med. Press*, Sept. 22, 1897.)

In order to obtain a view of the **larynx in infants, L. Lack** has designed the following method :—The index finger of the left hand is introduced into the mouth, and the terminal phalanx is hooked over the hyoid bone, pulling it forwards and upwards. The rest of the finger depresses the tongue, and if a small laryngeal mirror is then introduced in the ordinary way, the larynx can be quite easily seen. (*Proceed. Laryng. Soc.*, iv., 1897.)

The same result is effected by **Escat** with the use of a special tongue depressor; but it is a "forced method," and when Lack's method does not succeed it would seem better to resort to an anæsthetic and possibly **Kirstein's** autoscope. (*Arch. Inter. de Laryng.*, vi., 1896.)

The **electric trephine** and **saw** are warmly commended by **Moritz Schmidt** for rapid and complete removal of spurs or crests on the septum. The bleeding is usually insignificant, but if troublesome can be controlled with a pledget soaked in ferropyrin. (*Arch. f. Laryng.*, Bd. v.)

While allowing that various **laryngeal forceps** have special advantages in certain circumstances, **Massei** calls attention to the model of König as especially adapted for small fibromata. (*Arch. Ital. di Laring.*, Fasc. 3, 1897.)

Acetylene gas as an illuminant is recommended by **Lichtwitz.** (*Münch. med. Woch.*, Sept. 28, 1897.)

* For the loan of these four blocks the Editor is indebted to the courtesy of Dr. Thomas R. French, of Brooklyn, U.S.A.

GENERAL THERAPEUTICS.

Eucaine has been found by **Horne** and **Yearsley** to be most reliable in an 8 per cent. solution. Its anæsthetic action is slower in onset than that of cocaine but is fully as marked, and lasts about fifteen minutes. It does not contract erectile tissue, and it is free from the toxic effects sometimes induced by cocaine. Hence it is particularly indicated for children. (*Brit. Med. Journ.*, Jan. 16, 1897.)

Martin comes to much the same conclusions, but the drug has met with no general adoption, and it can only be in a few special circumstances that it is preferable to cocaine. (*Rev. de Laryng.*, Nov. 27, 1897; **Somers**, *Therap. Gaz.*, Jan. 15, 1897.)

The views expressed last year with regard to the employment of **guaiacol** as a local anæsthetic are confirmed by **Newcomb** (*N.Y. Med. Journ.*, Aug. 28, 1897). From no point of view is it superior to cocaine, but it is a fair substitute when the latter is inadmissible.

Holocaine is recommended by **Coosemans** in 1 per cent. solutions as having the advantage over cocaine of being non-toxic, in producing no vaso-constriction, and in causing less irritation. It is also cheaper, and solutions are not decomposed by keeping. (*Soc. Belge d'Otol.*, 1897.)

Airol is said to be superior to iodoform and aristol as an antiseptic in diseases of the throat and nose. (**Fasano**, *Arch. Intern. di Med.*, April, 1897.)

Peroxide of hydrogen, which was fully studied last year by **Georges Gellé** (*Arch. Intern. de Laryng.*, No. 5, 1896), has been praised by **Politzer** for its antiseptic and hæmostatic properties, and he has employed it with good results in hæmorrhage following the removal of nasal polypi, operations on the turbinals, etc. (*Monats. f. Ohrenheilk.*, May, 1897.)

Pynchon has found that there is great variety in the composition of **Dobell's solution** as quoted by various writers. He recommends the following:—℞ Sod. Bibor., Sod. Bicarb., āā ʒij, Listerine Oss, Glycerine Oiss., ʒj to Oj of tepid water (*Ann. of Ophth. and Otol.*, Oct., 1896). Carbolic acid should only exceptionally form part of any nose lotion.

Before a patient undergoes any operative treatment on the nose, **Harrison Griffin** suggests that he should be submitted to treatment with quinine or Warburg's tincture, to mitigate reaction. (*N.Y. Med. Journ.*, June 12, 1897.)

CONNECTION WITH REMOTE SYMPTOMS.

The relation borne by diseases of the nose and throat to general medicine formed the subject of the Lettsomian Lectures delivered in 1897 by **De Havilland Hall.** (*Trans. Med. Soc.*, 1897.)

The relations of nasal to mental disease have been treated by **Ziem** (*Laryngoscope*, Sept., 1897). **Castex** has drawn attention to the pathological relation between the nose and the eyes. (*Paris Méd.*, April 15, 1897.)

S. F. Snow believes that from 70 to 80 per cent. of all cases of **headache** of a hemicranial order are due to removable causes located within the nasal passages or adjacent air spaces. Excluding those headaches associated with inflammatory disease of the accessory cavities, the majority of the remainder show "points of contact within the nasal fossæ." After treatment suitable to the local condition, he finds that such cases are kept comfortable by a weekly or bi-weekly application of a spray of 3 grs. of iodol in 1 ounce of ether. If this causes smarting, the patient should respire quickly through the nose; or the spraying may be preceded by the application of a 2 per cent. solution of cocaine. This spray is useful in temporary turgescence, and for relaxed or sensitive membranes. (*Med. News*, July 10, 1897.)

The fact that **nephritis** is a possible sequel of tonsillitis is shown by **C. Baduel** (*Il Policlinico*, May 15, 1897), who describes four cases caused by the diplococcus of Fraenkel, which was present at the same time both in the blood and in the urine. There was always a certain interval between the tonsillitis and the nephritis; the course of the latter was variable in character but protracted, wasting and anæmia were marked symptoms, and there was no rise of temperature as a rule.

THE NOSE.

We now have a fluid extract of the pituitary mucous membrane, warmly recommended by **Rivière** for half the ills which the nose is heir to (*Lyon Médical*, Sept. 19, 1897). I suppose it was inevitable, and that every organ, gland, and membrane in the body must have its turn before the "animal extract question" arrives at the *juste milieu*.

Acute rhinitis.—To abort an attack, **Courtade** recommends irrigating the nostrils freely with warm water—from 45° to 55° C. But the water should have some alkali, such as soda or borax, added to it to bring its specific gravity to 1 per cent., and thus avoid exosmosis. (*Bull. Gén. de Thérap.*, Feb. 8, 1897.)

To relieve the blocking of the nose and diminish hypersecretion, **Sänger** recommends inhalation of ol. terebinth., or a 2 to 5 per cent. alcoholic solution of menthol. The powders which may be blown up the nose are ℞ Camphoræ, Acid. tannic. āā 2·00, Sacch. Lact. 4·00; or ℞ Cocaine Hydrochlor. ·01, Menthol ·10, Sacch. Lact. 3·00. Douches and syringes are to be avoided. Sprays are much safer. A mixture of equal parts of peroxide of hydrogen and water is very effective. Cocaine is not to be trusted in the hands of a patient, but a 2 per cent. oily solution of menthol may be used instead. Inhalations of steam, the use of compressed air, diaphoretics and quinine, salicylic acid, antipyrin, and especially salipyrin, are highly recommended. (*Therap. Monats.*, May, 1897.)

The uric acid diathesis is invoked by **Mulford** as the pathological basis of this affection. Consequently, the treatment should include calomel, podophyllin, alkalies, and a free supply of water. (*Amer. Med. Surg. Bull.*, Nov. 21, 1896.) Until we know more of the factors which lie at the basis of a "cold in the head," probably one method of treatment will be quite as effective as another.

Rhinitis sicca anterior has hardly commanded the attention which, considering how annoying it is to the patient, it merits. It affects chiefly the cartilaginous septum, and treatment should be undertaken as early as possible, for when once the mucous membrane is replaced by cicatricial tissue, a return to the normal is impossible. The patient should soften the crusts with an alkaline solution several times daily, and cover the surface with zinc or Hebra's ointment, containing 10 per cent. of subnitrate of bismuth. Yellow or white mercurial ointment is also of service. (**Ribary**, *Archiv f. Laryng.*, Bd. iv., Heft. 3.)

Epistaxis in childhood is not infrequently significative of heart disease. **Fruitnight** has collected twelve such cases. He advocates fresh lemon juice as a local remedy. (*Arch. of Pediat.*, Aug., 1897.)

Nasal asthma.—**Bobone** justly points out that, however brilliant may be the immediate consequences of local treatment, the disease returns if the general condition is not attended to. The latter, indeed, is by far the most important; for intranasal treatment does little beyond relieving the attacks. (*Arch. Ital. di Otol.*, 1897.)

Attempts to remove **foreign bodies** from the nasal cavities of children without anæsthesia are apt to be attended with struggling, and consequent danger from traumatism, as well as with difficulty and occasional failure. The following method is

recommended by **G. Bieser** as simple and efficient when anæsthesia is undesirable. The child is placed in the ordinary position for intubation, the assistant holding his hand over the child's mouth; one end of a piece of rubber tubing is inserted into the nostril opposite the one holding the foreign body, the other end is inserted into the operator's mouth. The operator then blows suddenly and vigorously into the nostril, and dislodges the offending body. The method should not be employed when the foreign body is too firmly impacted: the forcible insufflation might thus injure the middle ear. The patient's mouth must be firmly closed during the insufflation. (*Pediatrics*, July 15, 1897.)

Turbinotomy.—The enthusiasm of rhinologists has for some time centred round the question of entire removal of the inferior turbinal with Carmalt Jones's spokeshave. The whole matter was very judiciously considered by **Dundas Grant** in introducing a general discussion on the subject at the London Laryngological Society. He pointed out that in a large majority of cases sufficient relief to obstruction from hypertrophy of the inferior turbinal can be obtained by removal of either the anterior or posterior extremity, but that a certain number of cases remain in which it is beneficial. During the debate it was suggested that the very facility with which the operation can be performed had led to its abuse; for an air-way was rapidly restored to a patient in whom perhaps it would have been much better surgery to have rectified a septum, or performed only a partial removal of hypertrophied tissue (*Proceed.*, iv., 97). The objections to the operation are two in number. One, an immediate result, is the possibility of hæmorrhage; the second, a remote and much more serious one, is the probability of atrophic pharyngitis and chronic laryngitis in consequence of the abrogation of the important functions the nose has to perform in warming, moistening, and filtering the dry, cold, dust- and germ-laden air. Undoubted instances of such results were put on record, and the general result of the debate was to show that the operation has been abused, and that it can only be called for in a very limited number of cases. The same question formed one of the discussions at the meeting of the British Medical Association, and the operation of entire removal met with no support from our American *confrères*. **Bryson Delavan** held that its inventor had reported no result which could not be attained by simpler and less destructive measures (*Brit. Med. Journ.*, Nov. 13, 1897). **Stucky** has turned his attention to the middle turbinal, and makes the remarkable proposition that "the operation of turbinectomy is indicated whenever the bone presses against the nasal septum."

As it is much more difficult to find a middle turbinal which is not in contact with the septum than to find one which is, I think it would be wise to refrain from removing absolutely healthy tissue which has an important function to perform until, at least, the connection between it and symptoms complained of has been established (*Laryngoscope*, April, 1897). **Delavan** suggests a simple method for the reduction of enlarged turbinals without producing any loss of mucous membrane. He advocates submucous incisions by means of a small knife which he passes under the mucous membrane, and with which he makes a sweep through the submucous tissues. He then withdraws the instrument through the original opening, and in this manner the vascular coats of the vessels are broken, and clotting of the cavernous tissue takes place (*Med. Rec.*, June 12, 1897). **Norval H. Pierce** describes a similar plan, but in addition he inserts a probe, with chromic acid fused on it, along the track which is made (*Laryngoscope*, October, 1896).

Ozæna.—In the last issue of the "Year-Book" I referred to the claims of **Belfanti** and **Della Vedova** that this disease was caused by an attenuated type of the diphtheria bacillus of Klebs-Loeffler. Founded on this they instituted a treatment with diphtheritic antitoxin. The idea was taken up with more enthusiasm than discretion in the Latin countries; but within a short year the method had run its course, for the injections were found to be not only useless but actually harmful. The story is interesting as showing how mistaken may be the deductions which are drawn entirely from laboratory experiments.

Lautmann devotes a Paris *thèse* to the subject, and in the *Annal. des Mal. de l'Oreille*, March, 1897, gave a modified approval of the treatment with anti-diphtheritic serum. **Arslan** found the treatment sufficiently satisfactory to encourage him to continue it (*Arch. Ital. di Otol.*, 1897). **Molinié** claimed a cure in three cases (*Ann. des Mal. de l'Oreille*, April, 1897). **Compaired** also approved of the method, although he acknowledges that it presents many inconveniences and even dangers (*ibid.*, May, 1897). But in the very next number of the same journal **Gradenigo**—who had been one of the most ardent supporters of the serum treatment—acknowledged that it had not fulfilled the hopes it had inspired, that the improvement is only transitory, and that the injections sometimes give rise to dangerous symptoms. He recommends still another treatment—viz. intramuscular injections of iodine—and claims most encouraging results. But the method has already been criticised most adversely.

The subject was fully discussed at the 1897 Congress of the

Société Française d'Otologie, etc. (*Bull. et Mém.*, 1897 and *Arch. Int. de Laryng.*, No. 3, 1897). **Moure** deplored the scepticism which exists amongst practitioners as to our powers of relieving those afflicted with this dreadful complaint. Noting that the serum treatment of ozæna is already on the decline, he recommends what we may term the classical treatment. This consists of general symptomatic medication—cod-liver oil, arsenic, attention to the digestion, etc. If the patient is unable, or unwilling, to undergo long treatment at the hands of the physician, he is simply recommended to make frequent use of abundant tepid alkaline nasal irrigations, finishing with a tablespoonful of the following in a litre of tepid boiled water: ℞ Acid. Carb. pur. ʒj, Glycerine ʒvj, Aq. ad Oj. In much the same proportion one can employ lysol, the salts of sozoiodol, carbolate of soda, phenosalyl, resorcin, etc. The irrigation is followed by a spray of menthol oil. If the patient can submit himself to more direct treatment, he should several times a year allow his adviser to massage the mucous membrane thoroughly every other day for a few weeks, with a cotton-wool mop dipped in ℞ Iodi. grs. v., Potass. Iod. grs. x, Acid. Trichloracetic. grs. iij, Glycerine ʒij. This is followed by a nasal douche; the nose is sprayed with a 5 to 25 per cent. solution of nitrate of silver, and a final alkaline irrigation removes the excess of nitrate of silver. In any case, this method of treatment makes the patients tolerable to themselves and to those about them; it so clears the nose that not infrequently the source of suppuration can be traced to some of the accessory sinuses; and while some cases are actually cured, in others we may say that a cure is maintained so long as the treatment is kept up. There is always the hope, too, to fall back upon that, in the case of a female, marriage or pregnancy may eradicate the affliction. Much the same conclusions were arrived at in the discussion on the subject at the last meeting of the American Laryngological Association. The importance of avoiding destruction of tissue was insisted on, and sea air was said to be undoubtedly better than mountain air. (*Med. Rec.*, May 22, 1897.)

Acknowledging that the real cause of the disease is still unknown, and that therefore we must at present be guided by empirical clinical observations, **Ferreri** recommends the application of creosote to the diseased mucosa. The preparation employed is one made of equal parts of creosote and glycerine. A milder preparation is the following: ℞ Beechwood Creosote 5·00, Alcohol at 70° 10·00, Pure Glycerine 40·00. The upper lip should first be *smeared* with vaseline, to avoid irritating the skin; and the

application should be preceded by a nasal irrigation of a hypochlorite of calcium—a teaspoonful in a litre of tepid water. (*Arch. Ital. di Otol.*, Fasc. 4, 1897.)

Another much vaunted cure for ozæna, which has gone the way of all "booms," is that by interstitial electrolysis. Last year **Bayer** (*Rev. de Laryng.*, May 30, 1896) claimed it as "the best and almost specific treatment," although after the so-called "cure" micro-organisms were still abundant in the nose, and although the passage of the current in all cases caused pain, and out of a total of seven cases one died from the treatment. As **Cheval** claimed 91 per cent. of cures, a commission was appointed by the Société Belge d'Otologie to report on the result in seven cases submitted to Cheval for cupric electrolysis. One patient was lost sight of; among the other six there was not a single instance of cure! (*Journ. of Laryng.*, Aug., 1897.)

Empyema of the accessory sinuses.—The presence of a chronic suppuration of the frontal sinus, even with a patent fronto-nasal canal, constantly exposes the patient to the risk of an acute exacerbation. **Forestier** records such a case, in which death ensued from septic meningo-encephalitis. (*Arch. Intern. de Laryng.*, No. 4, 1897.)

The discovery of polypi in the nose should always raise a suspicion of chronic suppuration in one of the accessory sinuses, especially if the polypi show great tendency to recur rapidly. **Laubi** found that in cases of chronic empyema 35 per cent. of them were associated with polypi. (*Corresp. f. Schweiz. Aerzte*, June 15, 1897.)

Alexander found that in 149 cases of nasal polypi there was suppuration in one or more of the accessory cavities in no less than 90. (*Arch. f. Laryng.*, v., 1896.)

Krebs suggests that exploratory puncture of the antrum, which is now so common, may not be quite harmless, but that as asepsis in the nose is impossible, a healthy sinus may become affected. (*Archiv f. Laryngol. und Rhinol.*, Bd. iv., Heft. 3.) I have shown by numerous bacteriological experiments that the interior of the normal nose, with an intact mucosa, is practically sterile, and clinically there is no danger of infecting a healthy sinus by exploratory puncture, for the puncturing can be carried out quite aseptically.

Spiess is satisfied with results he has obtained from a new electro-chemical method of treatment he has designed. The cavity of the antrum is filled with salt solution; the copper wire terminal of one pole of a constant current is then introduced into the cavity, and when the current passes a threefold action takes

place—electrolytic, with deposit of newly formed chloride of copper; bactericidal action at the poles; and the cataphoresis produced by the passage of the stream from anode to cathode. (*Archiv f. Laryng.*, Bd. v.)

In the "Year-Book" for 1897 (p. 412) I described the **Ogston-Luc method** of draining the frontal sinus for chronic empyema. Since then Luc has adopted the same principles for suppuration

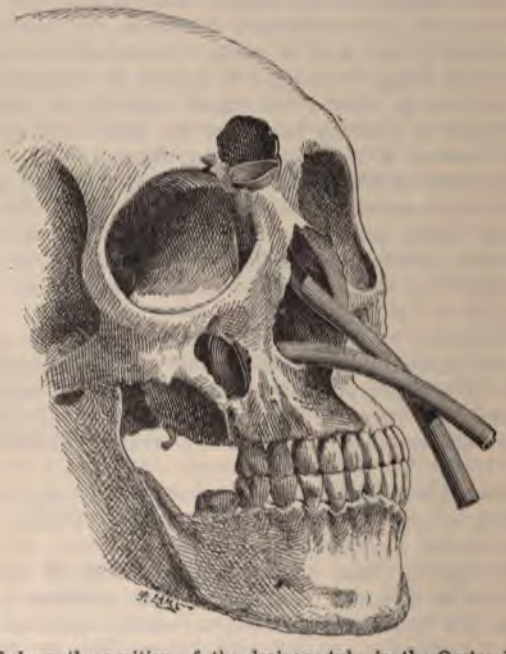

Fig. 6 shows the position of the drainage tube in the Ogston-Luc operation on the frontal or maxillary sinus.*

in the maxillary antrum. He turns back a flap from the gum, and opens the cavity through the canine fossa; the diseased walls are then inspected and treated, and a second communication is made from the cavity into the anterior part of the inferior meatus. The antral cavity is dusted with iodoform; a drainage tube is inserted in the sinus, with its orifice opening into the nose (Fig. 6), and

* For the loan of this *cliché* we are indebted to the kindness of M. Helme, *Editor of the Archives Internationales de Laryngologie.*

the buccal wound is then closed by replacement of the gum. The cavity, which now communicates solely with the nose, is cleansed with injections of etherial solution of iodoform. The drainage tube is left undisturbed for fifteen days, when it may be removed through the nose, and the cure is complete. (*Arch. Intern. de Laryng.*, No. 3, 1897.)

NASO-PHARYNX.

Doyen insists on the fact that large naso-pharyngeal tumours can invariably be removed, either through the nose or the mouth, without any of the mutilating resections of the nose or maxilla to which patients are submitted. The latter operations have been designed from the fear of hæmorrhage, and indeed these tumours generally bleed profusely on the slightest touch. But all that is required is to operate rapidly. With suitable raspatories the tumour can be as quickly enucleated from the naso-pharynx as an oyster from its shell, and once it is removed the hæmorrhage is easily and quickly checked. (*Bull. de l'Acad. de Méd.*, 1897.)

A remarkable case is recorded by **Kuh**, in which a large cancer of the post-nasal space—confirmed by microscopic examination—was entirely obliterated by twelve injections of alcohol, beginning with 3 minims and increasing the dose to 30. (*Med. Rec.*, April 17, 1897.)

Lennox Browne has been successful in treating fibroma of the palate by electrolysis. (*Journ. of Laryng.*, April, 1897.)

A very complete pathological and clinical study of naso-pharyngeal **adenoids** has been made by **M'Bride** and **Logan Turner**.

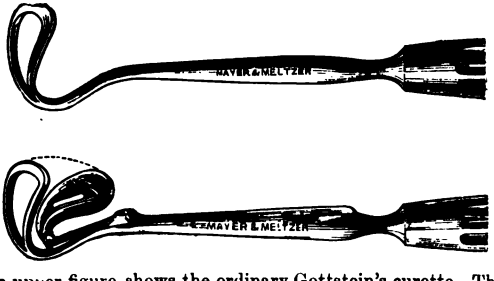

Fig. 7.—The upper figure shows the ordinary Gottstein's curette. The lower one illustrates the modification of Delstanche, in which a hinged shield armed with hooks secures the detached growth, and so removes it with the instrument.

As regards treatment, they have found chloroform the most satisfactory anæsthetic. The instruments used are Delstanche's

modification of Gottstein's curette (Fig. 7), Hartmann's lateral curette, and the finger nail if necessary. Adenoids and tonsils may be removed at the one operation, and it is generally better to remove the adenoids first and the tonsils afterwards. (*Edin. Med. Journ.*, April, May, June, 1897.) The same curette is recommended by **A. Cheatle.** (*Pediatrics*, April 15, 1897.)

But **Dundas Grant** considers that nitrous oxide, or nitrous oxide and oxygen, administered by a skilled person, is amply sufficient, and is the "unimpeachable anæsthetic" which ought to be exclusively used, except in young children. To them the apparatus for the administration of gas is unduly alarming, and chloroform is so exceptionally well borne that it is to be preferred. (*Journ. of Laryng.*, Aug., 1897.)

The method of administration of bromide of ethyl is fully described in the *Arch. Intern. de Laryngol.*, No. 1, 1897. It is very extensively used in France.

TONSILS AND PHARYNX.

Last year I referred to the favour which the use of salol had met with in the treatment of **acute tonsillitis.** **Coulter,** who had formerly employed salol, now prefers lactophenin in doses of 10 grains every three hours. As compared with salol, it is more prompt, and causes no undesirable after-effects. A mercurial cathartic and a saline, and incision at its proper time, also form part of the treatment. (*Journ. Amer. Med. Assoc.*, Nov. 7, 1896.)

It used to be taught that **peritonsillar abscesses** should not be incised till fluctuation could be felt, and some even hold that they should be left to burst spontaneously. Such an opinion is quite unjustifiable. It not only prolongs the suffering of the patient but exposes him to such a risk as is recorded by **Heddæus,** where septic pleurisy, pneumonia, and death were distinctly traceable to an unopened perintonsillar collection of pus. (*Münch. med. Woch.*, May 4, 1897.)

Although he agrees that the tonsillotome will be found in the larger number of cases to be thorough and effective, **Joseph S. Gibb** recommends the galvano-caustic wire—especially if used with the snare of Gradle, of Chicago—for adults and in cases where hæmorrhage is anticipated. He commends the galvano-cautery knife for the removal of sarcomatous growths limited to the tonsils. There is, of course, considerable reaction after the galvano-cautery. (*Ann. of Surg.*, July, 1897.)

In all inoperable cases of sarcoma of the tonsils **Heymann**

considers that he is morally obliged to try the effect of large and long-continued doses of arsenic. He has had cases in which no good effects have been obtained, but in others the results have been striking and even brilliant. (*Arch. Intern. de Laryng.*, No. 2, 1897.)

The value and success of removal of the tonsil are seen in a case operated on by **W. W. Keen** through an external incision (*Ann. of Surg.*, July, 1897), where a primary epithelioma of the tonsil showed no recurrence at the end of a year. In the same paper is recorded a case where a primary sarcoma of the tonsil extending to the pharynx, and attached to the base of the skull and the bodies of the vertebræ, was successfully removed with no recurrence after nearly three years. In both these cases the Trendelenburg position (*vide* p. 402) was of immense value, as it also was in a case of Da Costa's, reported in the same journal.

Last year I referred to writers who insisted on the necessity of thorough and rapid treatment in cases of **syphilis** of the nose. **Ohmann-Dumesnil** gives the same advice as regards syphilitic ulcers of the pharynx. As regards local treatment, they should be well cleansed with a perchloride solution, 1–1000, and then touched with a solution of acid nitrate of mercury in the strength of 1 to 8. (*The Laryngoscope*, Oct., 1896.)

Lingual tonsils.—On hearing that **A. J. Brady**, of Sydney, has in five years removed thirty-four lingual tonsils with a tonsillotome, one cannot help thinking that these hypertrophies of adenoid tissue are more apt to occur in Australia than on the European continent. (*Journ. of Laryng.*, May, 1897.) He employs a Mackenzie guillotine, suitably curved to pass over the dorsum of the tongue. He finds that, removed in this way, they bleed less than the faucial tonsils.

LARYNX.

The introduction of cocaine has considerably modified the technique of **removing laryngeal growths** *per vias naturales*, but it has not removed all difficulties, or made it possible for the unskilled to operate with impunity. **Middlemass Hunt** recommends that a 20 per cent. solution of cocaine be applied to the larynx on a brush or cotton-wool mop. He prefers the tube forceps to the large and powerful instruments of Fauvel and Mackenzie, and he points out that cocaine anæsthesia has largely done away with the argument in favour of the approach to a right angle which Mackenzie adopted in order to avoid touching the epiglottis. The catheter-curved instrument is more easily introduced and takes up less room in the pharynx. He rightly

observes that the galvano-cautery can never be a safe instrument to use on a vocal cord. (*Journ. of Laryng.*, Aug., 1897.)

Massei has had 500 cases of laryngeal tumour, and in this large experience he has never seen the least risk of cocaine poisoning—if there is no solution of continuity in the mucous surface—when the following plan is pursued:—A saturated solution of cocaine is prepared freshly each time it is required, and is applied directly 8 to 10 times consecutively. (*Arch. Ital. di Laringol.*, Fasc. 3, 1897.)

The indications for **intubation** are very well defined by **Damieno.** He points out that the choice between it and tracheotomy depends on the situation, form, and nature of the stenosis, and the skill of the operator. He holds (1) that intubation ought to replace tracheotomy in all cases of acute stenosis in children, with very rare exceptions; (2) that it may substitute tracheotomy in adults in acute or chronic stenosis, either supra- or infra-glottic, if the condition of affairs is verified from time to time, and the disease is not incurable; and (3) intubation is the best remedy for replacing the tracheotomy tube, after restoring the normal passage with Schrötter's laryngeal dilators. (*Archiv. Ital. di Laring.*, Fasc. 3, 1897.)

In the treatment of **stridulous laryngitis** the following is recommended (*Centrlb. f. d. gsmmte. Ther.*, xv., 1897, p. 444): ℞ Potass. Citrat. ʒiss; Pulv. Ipecac. ʒiij; Tinct. Opii. ♏xxj; Syrup. ʒiij; Aq. ad ℥vj. S. A teaspoonful every hour.

In order to relieve quickly the hoarseness of sub-acute or chronic laryngitis, **F. T. Rogers** has found the following most satisfactory when used in a nebuliser: ℞ Antipyrin gr. xv.; Pyridine ʒj; Sod. Nitrate ʒij; Tinct. Belladon., Tinct. Lobeliæ, Tinct. Stramon., Tinct. Ipecac., āā ʒv; Glycerin. q.s. ad ℥iv. If used with deep inspiration, it offers to the asthmatic the double value of exercise and medicine. (*Atlantic Med. Monthly*, March 20, 1897.)

Laryngeal paralysis.—In many cases of paralysis of one vocal cord it is very difficult, and sometimes even impossible, to discover the cause. **Dundas Grant** has put on record two cases in which the left vocal cord was perfectly immobile in the cadaveric position; there was no pathological condition to explain the symptoms, but there was evidence of alcoholic excess, and on reducing the supply of this the mobility of the cord was rapidly restored. (*Journ. of Laryng.*, Oct., 1897.) Another case, due to lead poisoning, has been observed by **Flatau.** Here, also, the left cord was in the cadaveric position, while the abduction of the right was paretic. (*Deut. med. Woch.*, No. 3, 1897.) **Heymann** directs attention to the paralysis which may result from inorganic

intoxication, and publishes three observations where it resulted from chronic lead poisoning, and one from arsenic. The paralytic phenomena were limited to the adductors, and this observation is contrary to the opinion of Mackenzie, who held that it was entirely the adductors which were attacked. (*Arch. Inter. de Laryng.*, No. 6, 1896.)

Papilloma.—The difficulty of eradicating papillomata of the larynx, and their tendency to recur, will command attention to **Heryng's** commendation of phenol-sulphoricinate. When rubbed with a 30 per cent. solution, he found that in some cases these growths disappeared without other treatment, and when applied to the bases of the growths after their removal with forceps, it effectually prevented their recurrence. The treatment must be kept up for some weeks. (*Therap. Monats.*, March, 1897.)

Anyone connected with a special hospital is aware of the prevalence of **throat affections among female teachers** in elementary schools. They possibly hardly realise that these troubles are so widespread as they have been shown to be by **E. S. Younge** (*Brit. Med. Journ.*, Sept. 25, 1897). Selecting at haphazard 100 presumably healthy female teachers, he found that only 30 were so obviously healthy that it was superfluous to examine them, and they were reckoned as normal; 45 per cent. of the total number were suffering from some definite lesion of the larynx or pharynx. The most potent factor concerned in the production of these throat affections appeared to be insufficient accommodation, leading to the necessity of holding two or more noisy classes in the same room. Other probable causes were the presence of particles of chalk in the air, bad acoustic arrangements, ignorance of the elements of voice production, and the commencement of duties at too early an age.

In the **acute laryngitis of children** **Variot** and **Glover** strongly recommend the steam-tent. The authorship of this construction is referred to English practitioners, and it is curious that it should receive such warm commendation in France just after it has fallen into disrepute in the country where it originated. Syrup of codeia is recommended as the best sedative for the cough; bromide of potassium for calming the nervous system and intubation—requiring, as it does, constant supervision—is more indicated in hospital than in private practice. (*La Méd. Mod.*, No. 64, 1897.)

Laryngeal tuberculosis was discussed at the Moscow Congress, and it is evident that no actual progress has been made since the same subject was debated at the last international gathering in Rome three years ago; but that the indications and

methods are more defined. **Scheppegrell** recommended cupric electrolysis. **Leduc** demonstrated an instrument by which the patient could treat himself by inspiring powders into the larynx. **Przedborski** recommended the local use of phenol-sulphoricinate. **Chiari** had never obtained a permanent local cure, but held that operative treatment was both justifiable and imperative in severe dysphagia. **Hajek** pointed out the difficulty of deciding which were suitable cases, and said that in several cases we may cure the larynx but kill the patient. (*Journ. of Laryng.*, Oct., 1897.) The new tuberculin has not proved of any service in this affection. (**Herzfeld**: *Deut. med. Woch.*, No. 34, 1897.) Inhalations of lignosulphite are recommended by **Bramesfeld**. (*Deut. med. Woch.*, No. 14, 1897.)

Cancer of the larynx.—In early cases **Schmiegelow** unhesitatingly declares that laryngo-fissure, with excision of the diseased parts, and immediate removal of the tampon cannula, is the operation to be selected. (*Ann. des. Mal. de l'Oreille*, April, 1897.) **Botey** adopts all the points already insisted upon by Semon, the gist of the matter being early diagnosis and extirpation of the soft parts by laryngo-fissure. (*Arch. Internat. de Laryng.*, No. 6, 1896.)

When the case is too far advanced to hold out any hopes of complete eradication by laryngo-fissure, the possibility of excising the entire larynx still remains. Much better results are now obtainable from this operation if the upper end of the trachea is stitched to the margin of the wound. **W. G. Spencer** and **Lambert Lack** showed cases at the Laryngological Society of London where the entire larynx had been removed in this way, and the patients had made good recoveries. (*Proceedings*, iv., 1896) From a paper by **Graf** it appears that Von Bergmann has also adopted the method of fixing the trachea to the lower end of the skin wound, thus cutting off all communication with the pharynx. Since this was adopted the death-rate from the operation has undergone such a marked diminution that extirpation of the larynx is considered a perfectly justifiable operation. (*Deut. med. Woch.*, May 6, 1897.)

In the discussion of this subject at the Moscow Congress, **Krause** said the results of laryngo-fissure are seldom permanent. He was more in favour of total extirpation, stitching the end of the trachea to the skin in front. **Spengler** spoke in favour of parachlorphenol, lightly painted on, in cases which were inoperable; it is a strong but non-irritating antiseptic, and has a marked anæsthetic action. **Heryng** urged the harm of chromic acid and the *galvano-cautery* in these cases. As to diagnosis, **Rosenberg** thought

that limited movement of the cord was more common in pachydermia than in cancer; he considered "lazy movement" of the cord more characteristic. **Hajek** held that lazy limited movement of the vocal cord was not a trustworthy symptom, as it was often absent in cancer and just as often present in pachydermia. (*Journ. of Laryng.*, Nov., 1897.)

The figures of **Fraenkel** show that it is possible to extirpate the disease radically with the forceps when the disease is so situated that the entire growth, and even the neighbouring healthy tissue, can be removed. Of 9 patients on whom he had operated by the endo-laryngeal method, 5 were completely cured; the cure lasting respectively 13 years, 10 years, 9 years, 6 years, and 15 months. (*Archiv f. Laryng.*, vi., 2, 1897.)

Intratracheal injections.

This method is recommended by **J. C. Bowie** (*Edin. Med. Journ.*, Aug., 1897) for spasmodic and bronchial asthma. The fluids should be non-irritating, and those of an oily nature and low specific gravity are absorbed most quickly. If the patient is injected three or four times in the day, it is possible to keep the pulmonary tissues completely under the direct influence of therapeutic agents. Even 3 oz. of fluid may be injected during 24 hours; the amount at each sitting varying from 3 to 5 drachms. The solutions used are: (1) A 5 to 20 per cent. solution of menthol in almond oil; (2) 2 to 5 minims of a 2½ per. cent. solution of pure crystals of iodine in almond oil, added to each drachm of the first solution; and (3) 5 minims of a 10 per cent. solution of oleum lupuli in almond oil added to each drachm of the first. If the patient is a victim to spasmodic asthma, two or three injections should be given daily of a 10 to 15 per cent. solution of menthol. When an attack is imminent 2 to 5 minims of the iodine solution should be added to each drachm of the menthol solution, and continued throughout the attack. The oleum lupuli is a sedative and antispasmodic, and is useful in deep spasms.

NEW PUBLICATIONS.

"Handbuch der Laryngologie und Rhinologie." Edited by **Paul Heymann**. Wien: Alfred Hölder. In 3 volumes. Further instalments of this large work have appeared during the past year.

"The Malignant Laryngeal Tumours," by **John Sendziak**. Warsaw.

"Die Krankheiten der oberen Luftwege," by **Moritz Schmidt**. Zweite Auflage. Berlin: Julius Springer. 1897.

"Diseases of the Ear, Nose, and Throat," by **Seth Scott Bishop**. Philadelphia: The F. A. Davis Company. 1897.

"Diseases of the Nose and Pharynx," by **James B. Ball**. London: Baillière, Tyndall & Cox. Third Edition. 1897.

"A Text-Book of Diseases of the Nose and Throat," by **F. H. Bosworth**. London: Baillière, Tyndall & Cox. Third Edition. 1897.

"The Laryngoscope." Beginning with January, 1898, a British and Colonial edition of this monthly journal, edited by StClair Thomson, will be published by Wright and Co., Bristol.

TROPICAL DISEASES.

By Patrick Manson, M.D., F.R.C.P., LL.D.,

Physician to the Seamen's Hospital Society—Branch Hospital, Albert Docks.

Malaria.

During the past year the malaria parasite and the pathology of malarial disease have been studied by an increasing number of observers, and one or two fresh facts of importance have been made out in this, the most important branch of tropical medicine.

Exflagellation.—In the *Lancet* of Oct. 24, 1896, **Marshall** pointed out that if a droplet of distilled water be placed on a microscope slip, and a cover-glass charged with crescent-containing blood be dropped on the water, the transmutation of crescents into flagellated bodies is effected in the course of a very few minutes. He further states that whereas the healthy blood corpuscles become quickly decolorised under the influence of the water, such corpuscles as contain the small amœboid parasites are not so affected, but retain their hæmoglobin, the included parasites meanwhile becoming swollen, globular, and more easily discovered in consequence of their pigment being rendered more visible.

In the *Brit. Med. Journ.* of Feb. 17, 1897, **Surgeon-Major Ronald Ross** pointed out that the evolution of the malaria crescent is also favoured and accelerated by an exposure of the blood to the air for from one to four minutes before mounting it on the slide. On the other hand, he shows that the transformation is effectually inhibited if contact with the air is altogether prevented, as by pricking the finger through vaseline and transferring intact the balloon of blood so formed to the microscope slide; so long as the coating of vaseline is unbroken, so long will the crescents remain crescents. But if the coating of vaseline be broken and the blood be exposed, even momentarily, to the air, the crescents will in many instances proceed to spherulation and exflagellation. These experiments of Marshall and Ross the writer has successfully repeated.

Staining the flagellated body.—In the *Brit. Med. Journ.* of

July 10, 1897, **Manson** describes an easy method of procuring and staining the flagellated form of the parasite as follows:—Thirty or forty strips (3 inches by $1\frac{1}{2}$ inch) of thick blotting paper, each having an oblong hole (1 inch by $\frac{2}{3}$ inch) cut lengthways in its centre, are prepared; they are then slightly but sufficiently moistened with water and laid in rows on a sheet of window glass. A patient in whose blood the crescent form of the malaria parasite abounds is selected. His finger is pricked and a minute droplet of blood, the size of a large pin's head, is expressed. A clean microscope slip is then breathed on once, and the droplet of blood immediately taken up by lightly touching it with the centre of the breathed-on surface of the slip. The blood is now rapidly and somewhat unevenly spread out with a needle so as to cover an area of about $\frac{3}{4}$ inch by $\frac{1}{2}$ inch. Immediately the slip is inverted over the blotting-paper cell and pressed down sufficiently to secure thorough apposition of the slip to the paper without, at the same time, bringing the blood into contact either with the moistened paper forming the wall, or with the glass forming the floor of what is now a very perfect moist chamber. The rest of the paper cells are rapidly covered with blood-charged slips prepared in the same way. In from half to three-quarters of an hour the slips are removed and dried by gently warming them over the spirit lamp—blood surface away from the flame. When dry, the films are fixed with absolute alcohol, a few drops being poured on each. After five minutes the alcohol is dried off, and a few drops of weak acetic acid (10 to 20 per cent.) are laid on the film and left there long enough thoroughly to dissolve out all the hæmoglobin. The slides are then washed in water and dried. They may now be stained with various reagents. So far, I have obtained the best results from weak carbol fuchsin (20 per cent.) and prolonged staining. The stain is dropped on the slip and covered with a watch-glass; after six to eight hours it is washed off, the slide dried, and a cover-glass applied with zylol balsam. The staining, though sufficiently intense, is fairly transparent. Most of the slides will show numbers of spheres and several or many well-stained flagellated bodies. Very few crescents remain untransformed. If the slips are removed and dried in from five to ten minutes after being placed on the blotting-paper cells, only crescents, ovals, and spheres will be found; if they are left for three-quarters of an hour to an hour, free flagella and what Ross calls spent pigment may be found, the latter sometimes enclosed in phagocytes. Occasionally flagellated bodies are also found *partly* included in phagocytes.

Malaria parasite in mosquitos.—**Ross**, who some time ago ascertained that the crescent plasmodium rapidly proceeded to exflagellation in the mosquito, has recently (*Brit. Med. Journ.*, Dec. 18, 1897) described certain pigmented cells in the stomach wall of a particular species of mosquito after it has fed on crescent-containing blood. In the insects in question, which were killed and examined three and four days after feeding, a considerable number of these cells (which, besides being markedly pigmented, were round or oval, and remarkably distinct) were seen towards the pyloric end of the stomach. The cells stood out sharply defined, and manifestly differed in character from any other structure in the neighbouring tissues. The pigment in the cells was fairly abundant. In some instances it was scattered irregularly through the protoplasm; in some instances it observed a roughly linear arrangement; whilst in other instances it formed a small circle, recalling the arrangement of pigment observed in certain of the crescents, ovoids, and spheres in malarial blood. The pigment was optically indistinguishable from the melanin characteristic of the malarial parasite. The exact significance of this discovery as regards the extra-corporeal phase of the malaria parasite is still to be determined. It may be that the pigment in these cells was derived from the remains of flagellated organisms in the blood ingested by the mosquitos, and therefore merely evidence of a digestive act; on the other hand, it may belong to a growing malaria parasite which had entered, coccidium-like, the cells in question, and constitutes a feature of a phase of the extra-corporeal life of this important parasite. If the latter should prove to be the case, Ross has made a discovery of the first importance.

The significance of exflagellation.—**MacCallum** (*Lancet*, Nov. 13, 1897) describes certain interesting and possibly important observations on the flagellated phase of the malaria parasite, and of a similar parasite (*halteridium*, Labbé) of the crow. In infections by the latter parasite two forms of mature parasites are seen to escape from the blood corpuscles after the blood has been mounted on the microscope slide. These bodies are alike in shape and size, only differing inasmuch as one is granular and the other hyaline. The hyaline parasites in the course of a few minutes emit flagella which, breaking away, approach the granular parasite and attempt to enter it. They crowd round the granular sphere, butting it with their bulbous ends. Finally, one of the flagella effects an entrance; whereupon after about five minutes, the now impregnated granular parasite gradually changes shape and becomes an elongated motile body (the "vermicule"

of Danilewsky) which at once commences to travel about the field, penetrating and traversing the red blood corpuscles and even the leucocytes. After a time it becomes quiescent, and finally disintegrates. Twice in a case of a high degree of malarial crescent infection in a woman MacCallum witnessed a somewhat similar phenomenon. On the microscope slide the crescents underwent the well-known transformation into oval and sphere, and a proportion of them proceeded in the usual way to exflagellation and liberation of flagella. On two occasions MacCallum saw flagella attack and enter spheres which had themselves not emitted flagella. The entrance of the flagellum was in neither instance followed by transformation into a vermicule similar to that of *halteridium*, but the manifest similarity of these parasites is so distinct that one is justified by analogy in concluding that, under natural conditions, such a transformation might occur in plasmodium malariæ as well as in *halteridium*.

MacCallum, in commenting on the *halteridium* transformation, remarks: "The idea suggests itself, from their great power of penetration, that they may be the resistant forms that escape from the body (of the host) during life into the external world. The whole process described above seems to be a sexual process analogous to the sexual process seen in the lower animals and plants which occurs under unfavourable conditions and results in the formation of a resistant spore." The writer would suggest, however, that seeing that the phenomenon occurs only outside the body, it cannot be that this vermicular development of *halteridium* is intended for escape from the body; and, applying the observation on *halteridium* in conjunction with what MacCallum has seen in the case of the malaria flagellum and what Ross has seen in the mosquito, he conjectures that the travelling, cell-piercing vermicule is intended to enter some cell in that insect and there to develop into the coccidium-like organism which Ross has described in the cells of the stomach wall. According to this view, therefore, the exflagellation of the crescent body would be the first step in the extra-corporeal life of the malaria parasite, the entrance of a flagellum into a malarial sphere the second, the development of a locomoting vermicule the third, and the entrance of the latter into a cell in the mosquito's stomach the fourth step of the extra-corporeal life of plasmodium malariæ.

Histological anatomy of malaria.—Thin read a paper at a meeting of the Medico-Chirurgical Society of London (Oct., 1897) on the histology and pathology of the pernicious fevers of Sierra Leone, which confirms in great measure the descriptions of *Bignami* and Barker of the histology of the principal organs in

malaria cadavers. The parasite of these African fevers seems in no respect morphologically different from the ordinary æstivo-autumnal malignant parasite of the Italian and American writers.

Rules for giving quinine in malarial hæmoglobinuric fever.—There has been no important advance during the year in the therapeutics of malaria. Certain very rational rules for the administration of quinine in hæmoglobinuric attacks have been formulated by **Bastianelli**, which may be a welcome guide in the management of this type of pernicious malarial infection.

After pointing out ("Le Emoglobinurie da Malaria, secondo i recenti Studii"; *Ann. di Med.*, Anno ii., Fasc. 2) that hæmoglobinuria rarely, if ever, occurs in the first or earlier attacks of malaria, but only after the patient has become markedly anæmic, and that it is now practically proved that hæmoglobinuric fever is associated with, if not caused by, the so-called æstivo-autumnal parasite, he divides the cases into two categories: (*a*) Spontaneous hæmoglobinuria and (*b*) quinine hæmoglobinuria.

(*a*) *Spontaneous hæmoglobinuria*, which may be intermittent, or which may occur only in a single paroxysm, he breaks up into (1) paroxysmal hæmoglobinuria, in which the hæmoglobinuria occurs at the time of the segmentation of a group of parasites, and in which the young hyaline parasites are to be found in the blood during the paroxysm.

(2) Post-paroxysmal hæmoglobinuria. In this form only crescents or only pigmented leucocytes, or both together, are to be found in the blood. They are evidences of the recent presence of the febrogenetic forms of the proliferating parasite, which have so altered the blood and organs that hæmoglobinuria may continue, or recur, for days after the febrogenetic parasites themselves have disappeared from the circulation and viscera.

(3) Post-malarial hæmoglobinuria. In this type an examination of the blood and organs reveals neither the febrogenetic forms of the parasite, nor crescents, nor pigmented leucocytes. Only *post-mortem* examination discovers in the endothelial, perilobular, and perivascular pigmentation the unquestionable evidences of antecedent malarial infection. This form may be intermittent or continued, and is apt to be very severe. It is especially grave.

Quinine, Bastianelli asserts, does give rise, in certain cases and individuals, to hæmoglobinuria; but this it does only on condition that these individuals are, or have been, subjects of malarial infection. In such it may cause hæmoglobinuria during a malarial attack, either while the infection is active or after the disappearance of the parasite from the blood. Small doses even

may suffice to provoke the symptom. In these cases he regards the malarial cachexia as the essential predisposing cause; the existing, possibly active, malarial infection an accidental predisposing element, and the quinine the provoking agency.

Quinine hæmoglobinuria he divides into two forms:—(1) That occurring during the fever paroxysm—paroxysmal quinine hæmoglobinuria; (2) post-malarial quinine hæmoglobinuria. In both of these categories it is the quinine which provokes the hæmoglobinuria, and in such cases it will do so whenever administered.

Logically basing them on these views, Bastianelli formulates the following rules for the administration of quinine in hæmoglobinuric fever:—(1) If parasites are present in the blood, quinine should always be given. (2) Should hæmoglobinuria set in during a malarial attack, and if, on examination, it is found that there are no parasites in the blood, quinine, if it is being given, should be stopped, or if it has not already been given, it should be withheld; this, because if it has already been given the drug has already destroyed all the parasites, or if it has not been already given, because the activity of the infection has ceased. In either case there is no longer necessity for the drug. If uselessly given there is the risk of its causing a hæmoglobinuria which, in its absence, might not have occurred. (3) If hæmoglobinuria comes on during a malarial attack, and while quinine is being given, should parasites persist in the blood the drug must be persevered with, notwithstanding any risk there may be of the drug aggravating the symptom.

Monsonia ovata in dysentery.—**Maberly** (*Lancet*, Feb. 6, 1897) states that he was led to use a tincture of this plant in the treatment of dysentery by having seen or heard of certain cases which had resisted the ordinary methods of cure, but which had subsequently been treated with remarkable success by a tincture of some unknown plant procured from a settler in South Africa. So impressed was he with the results of treatment in these cases that he made many attempts to learn the name or names of the plants employed. Acting on a hint supplied by a fragment of the plant, which came into his possession, he searched for the original which, he is now convinced, is some species of *monsonia*. At all events, he obtained equally good results from a tincture prepared from *monsonia ovata* ($2\frac{1}{2}$ ounces of the dried plant to the pint of rectified spirit). He cites one hundred cases of acute and chronic dysentery which he treated with this preparation. All were successful. In the chronic cases treatment lasted on an average for 8·1 days, in the acute cases for only 2·3 days. There were no relapses. *Monsonia* grows in the Transvaal,

and also in Matabeleland. It is an annual, and must be gathered in January or February. This drug is now on sale in England.

Milk treatment in chronic intestinal flux.—The value of a diet consisting exclusively of milk in the treatment of many forms of chronic intestinal flux is now thoroughly established. In the majority of cases of that rebellious form of tropical flux known as "sprue," or psilosis (which is characterised by a peculiar form of superficial ulceration or, rather, erosion of the buccal mucosa, flatulent dyspepsia, diarrhœa of clay-coloured, frothy, and exceedingly copious stools, a peculiar cachexia, general atrophy, chronicity, and a tendency to relapse), the milk treatment, properly and persistently carried out, is now generally acknowledged as being on the whole the most effective hitherto devised. It is occasionally equally effective in chronic dysentery. As a rule, simply to direct such patients to take from 3 to 7 pints of milk in divided quantities at short intervals during the twenty-four hours, and at the same time to eschew all other kinds of food and drink, suffices. Occasionally, however, for a variety of reasons, it becomes necessary to be more explicit in our directions and, possibly, to manipulate the milk in various ways, to secure the desired result. **Thin**, in his recently published monograph ("Psilosis or 'Sprue': its Nature and Treatment." London: J. & A. Churchill. 1897) gives some admirable practical hints on this subject.

Some French writers, with the view of obviating the risk of tuberculous infection, which may be incident to a long course of dieting on uncooked milk, recommend that in these cases the milk should be boiled. Thin, however, prefers undiluted and unboiled milk. He says, "Having decided on the quantity of milk that I think it well to begin with in a given case, I recommend this quantity to be taken between seven o'clock in the morning and ten o'clock at night, and when the quantity ordered is small I advise a tenth part of the total quantity to be taken every hour and a half. If, for example, I order 5 pints for the daily consumption, I recommend the patient to take ½ pint every hour and a half. If the quantity given is larger, the interval between the doses is shortened. If 7½ pints were to be given, ½ pint should be taken every hour. If a still larger quantity is required, the patient is directed to take the milk still more frequently. I do not recommend his taking more at one time than ½ pint. He is directed to drink his milk very slowly, spending, when practicable, from five to ten minutes over the consumption of the dose. Prolonging the interval

and increasing the quantity taken at one time does not help the digestion of the milk. If there is any difficulty in taking the quantity into which the doses are divided, it can be subdivided and half the quantity given, the intervals being diminished by one-half. I am certain that digestion is facilitated by its being given with great punctuality and at regular intervals. When the patient is strong enough to move about he is prone to transgress the regulations laid down, and is very apt to pass an interval and make it up afterwards, by taking a double quantity at one time. I strongly deprecate this practice, and prefer that the patient should lose the quantity that has been omitted rather than take an increased amount to make up for the omission."

Thin has little faith in koumiss, but has had excellent results in bad cases from Surgeon-Major Goldsmith's plan of aërating the milk with carbonic acid, which imparts a tart flavour, agreeable to many patients, besides increasing digestibility. Goldsmith recommends the following method of preparing the aërated milk: (1) Boil the milk and add a small quantity of carbonate of soda. (2) When cold, pour it into the lower globe of a seltzogene, insert the plug of the seltzogene, and pour into the upper globe successively (*a*) the tartaric acid in largish crystals; (*b*) bicarbonate of soda, and (*c*) about 4 ounces of water. (3) Remove the plug and screw on the top of the machine quickly. The printed directions given with the seltzogene indicate the amount of the aërating ingredients required. The machine must be scoured out with strong solution of soda every time after use, and the tubes and top thoroughly soaked in water and cleaned. The milk is ready for use in four hours, and should be prepared twice a day in warm weather.

Some of these patients are unable to consume sufficient milk to sustain life. In such cases the requisite quantity of nourishment may be introduced by concentrating the milk by evaporation. Thin gives the following directions for preparing this concentrated milk: "The enamelled pan used for the milk should be placed over hot water in order to prevent burning of the milk. The vessel that contains the hot water is most conveniently warmed over a spirit lamp, the water vessel and the enamelled pan being made to fit each other, and they should be round. The milk must not be allowed to boil, but should be heated quickly and stirred continuously after it gets warm and until it has become cold to prevent a skin forming. If the cream is allowed to come to the top, the milk takes longer to evaporate and the taste is not so good. When the evaporation is properly effected the cream remains in the milk as usual, but of course

rises on standing. The milk should, therefore, be stirred before being drunk. The milk should be reduced to one-half its original bulk. Each evaporation will probably occupy about an hour and a half, and as constant stirring is necessary the process is sufficiently irksome."

In ordinary cases in which the unevaporated milk is used patients should begin with from 3 to 4 pints in the twenty-four hours, and gradually increase the amount to 8 pints and upwards according to capacity. On any quantity above 6 pints the patients begin to put on weight.

In serious cases the patient should keep his bed, swathe the abdomen with a flannel bandage having a pad of cotton beneath it, and he ought, in cold weather, to have his room warmed. When stools have been solid for a fortnight the patient may get up; but for a long time anything like active exercise should be avoided. The avoidance of chill is a matter of the first importance, as it is a common cause of relapse.

Occasionally, in sprue cases, the milk treatment fails, and in defiance of all efforts to procure its digestion and absorption diarrhœa and progressing weakness continne. In such cases it is advisable to have recourse to beef juice, as much as from 12 to 20 pounds of raw beef-steak being used for the purpose of obtaining the requisite quantity of juice in the twenty-four hours.

Thin has little faith in drug treatment in these cases. He endorses Sir Joseph Fayrer's opinion that if milk does not succeed there is not much to be expected from other treatment.

PUBLIC HEALTH AND HYGIENE.

By Edward F. Willoughby, M.D. (Lond.), D.P.H. (Lond. and Camb.).

EPIDEMICS AT HOME AND ABROAD.

1. The plague in India.

The circumscribed area and other special circumstances of the island of Hong Kong, with the strict, almost martial, law which it was possible to maintain, enabled the authorities to grapple firmly with the outbreak of the plague. While the sanitary conditions of the quarter in which the European, Indian, and Japanese families reside present an almost ideal perfection, and the epidemic was practically confined to the Chinese quarters, and was speedily stamped out by the vigorous measures adopted, it afforded an unprecedented opportunity for the study of the disease, in which **Drs. Cantlie** and **Lowson** took the clinical side, **Professors Kitasato** and **Aoyama** the bacteriological, the former having identified the specific bacillus, and **Yersin** succeeded, though too late for practical purposes in that epidemic, in preparing an antitoxin for the disease. But in September of 1896 the plague made its appearance in Bombay, where it found sanitary conditions the very opposite of those in Hong Kong—a teeming and dense population, with many religious prejudices, and highly susceptible to panic, crowded on a low-lying site, with stagnant waters and marshes, the sewers faultily constructed, and the soil sodden with filth, a superabundant water supply aggravating, rather than ameliorating, the evils of an inconceivably perverse administration. The natural results of these conditions were an epidemic of unparalleled severity and persistence, while the exodus of a large portion of the panic-stricken inhabitants led to outbreaks of a serious character at Poonah, Kurachi, and elsewhere; and it is a matter for surprise and thankfulness that the plague, which is not yet extinct in Bombay, has not *spread* far and wide among the rural populations, still enfeebled *by the recent* famine. **Yersin, Haffkine**, and **Hankin** have continued

their researches, and the success that has attended the employment of antitoxins prepared by somewhat different methods has been such as to encourage the hope that in the future it may prove a really valuable means of defence.

2. Yellow fever in New Orleans.

In September, 1897, yellow fever reappeared, after a long absence, at New Orleans. There the authorities know, from past experience, how to contend with a familiar foe, but they are seriously hampered by the ignorant opposition of the poorer Italian population; and what dimensions the epidemic will ultimately assume it is, as yet, impossible to foresee.

The alleged discovery of the bacillus of yellow fever some years ago by **Fereira**, of Rio, proved, like many others of like nature, to be an error. But within the last twelve months a young Italian physician, **Sanarelli**, a distinguished graduate of Siena, and now director of the Institute of Hygiene at Monte Video, has established, beyond doubt, his claim to the honour of detecting and isolating the pathogenic microbe of this disease, which, with the plague and cholera, is one of the most fatal of the contagia. His researches are in course of publication in the *Annales de l'Institut Pasteur*, and we may hope that, as with the others just mentioned, the discovery of the bacillus and its toxin may shortly be followed by that of the antitoxin.

3. Enteric fever at Maidstone.

In England there was a comparative exemption from epidemic disease, with two exceptions—the outbreak of enteric fever at Maidstone (which has surpassed in severity any on record, save that at Worthing in 1893), and another at Lynn. The immediate cause of the former was the pollution of the soil around the open and unprotected spring at Farley, one of the four sources whence the water company drew their supplies, by the establishment in close proximity of a camp of hop-pickers. In this respect it resembled the outbreak of cholera at Hamburg in 1893, which owed its origin to the pollution of the Elbe at a short distance above the intake of the water-works by infected Russian emigrants camped in the adjacent meadows while awaiting embarkation for America. But though this accident was the actual cause, it was but the spark that kindled the fuel ready to hand in the grossly defective construction of the sewers, the effluvia from the ventilating shafts of which have year after year given rise to local outbreaks of diphtheria; in the neglect of the water company to protect their sources of supply, for they even encouraged the occupiers of allotments near the works to spread nightsoil on the surface

of the ground, in which the Sanitary Authority acquiesced; in the failure of the latter to control the company, and their discontinuance, for the purpose of saving the paltry expense of forty shillings a year, of the quarterly merely chemical examination of the water; and in their apathy and habitual ignoring of the recommendations and warnings of their Medical Officer of Health. Pending the result of the inquiry by the Medical Inspector of the Local Government Board, Dr. Theophilus Thompson, for fuller information as to these questions, we may call attention to the able report of the special commissioner of the *Lancet*, in which the inadequacy of the water theory to account for all the phenomena of the epidemic, and the part that the sewerage must have taken are well shown in a map, from which it appears that the low-lying quarters on either side of the Medway enjoyed comparative immunity, contributing fewer than 50 of the 2,000 cases, the incidence of the disease being almost wholly in the higher and in great part wealthier and less densely peopled districts, in which the consequences of the escape of the ascending sewer-gases would naturally be more felt. Like Worthing—where, however, the pollution of the water supply was due to an accident that could not have been foreseen—Maidstone has paid heavily for its sins in the past.

While the epidemic at Maidstone was in progress, two others broke out—at Ligoniel, near Belfast, and at Lynn, a fishing and seaport town at the mouth of the Ouse, in Norfolk. The former was traced to the discharge of the evacuations of three typhoid patients on the surface of a field sloping towards a reservoir of water in itself excellent; the latter, to the use of a supply drawn from various sources, each more or less polluted at all times, and conveyed by an open, unprotected channel, and therefore exposed to specific contamination whenever the germs of disease chanced to be introduced. The favourite source, as being the brightest and most copious, was springs rising from the chalk beneath the cemetery; other supplies were drawn from wells surrounded by cesspits, and from brooks into which the sewage of the adjacent villages was openly discharged. Much capital had been made of the Maidstone epidemic by politicians who look on "companies" and "capitalists" as inherently corrupt, and who maintain that such neglect would not have been possible had the water supply been vested in the municipal authorities and elected representatives. Now this very control existed at Lynn, where, in spite of the protests and warning of local medical men, and scientific authorities like Mr. Whittaker, F.R.S., of the Geological Survey, of inquiries by inspectors of the Local

Government Board, and the experience of two previous outbreaks within the last dozen years, the authorities had taken no steps to guard against the danger; and, when they did propose to substitute pipes for the open channel, they were induced to withdraw the scheme by a public meeting of the ratepayers convened to denounce the expenditure it would involve.

4. An **International Sanitary Conference** was held at Venice on the measures to be taken against a possible extension of the Bombay plague to Europe. It can scarcely be said to have done more than give an international sanction to the procedures already recommended by British medical and sanitary authorities in India and the Far East, based as they were on clinical and bacteriological observation. But it is a matter for congratulation that the representatives of the Mediterranean States no longer showed that distrust of British methods and motives, and that adhesion to obsolete beliefs, repudiated by their own leading scientists, which have so hampered conferences on Cholera and like subjects in the past, and even inflamed racial antipathies.

5. Cattle plague.

The Bacteriological Institute at Capetown has already made good use of the opportunities presented by the epizoötics of a vast cattle-rearing region, and Edington has succeeded in preparing from the glycerinised blood serum of animals suffering from cattle plague or rinderpest—using citric acid or potassium citrate to prevent coagulation—an antitoxin which appears to possess decided advantages over that of Koch, and is so appreciated by the breeders that glycerine has to be bought in Europe by tons at a time to meet the demand for the prepared serum.

A like success has attended the experiments of Edington in the production of immunity in horses against an infectious fever locally known as "the horse sickness"; and lastly he has received from all parts the most gratifying reports and evidence as to the destruction of locusts by means of his cultures of a fungus which, parasitic on that insect, produces a fatal and highly contagious disease among the flights feeding on pastures or crops that have been previously "inoculated" or infected therewith.

6. The **serum test for typhoid** is taking a more definite shape as disturbing conditions are becoming better understood; but although advantage has been taken of the Maidstone epidemic to test the value of an alleged antitoxin or immunising serum, the extreme uncertainty of communication of the disease, which is practically confined to ingestion—*i.e.* of water specifically contaminated, or foods as milk, vegetables, and shellfish infected by or serving as the vehicles of such water, or by

means of soiled hands, etc.—will necessitate the accumulation of an enormous mass of evidence, conclusive and exclusive, before one can accept as proven the claims of any serum to confer immunity.

7. Vaccination.

Considerable anxiety has been felt of late among public vaccinators by a rumour that, whereas formerly the Local Government Board refused to recognise the use of calf lymph, and allowed payment for arm to arm vaccination only, they are about to upset the existing optional arrangement, and to insist on the exclusive employment of calf lymph in official vaccinations, although cases are of frequent occurrence in which parents wish for lymph from the arm of an infant they know.

The experiments and experience of **Voigt, Haccius, Simpson, King, Freyer,** etc., confirming those of Jenner, Thiele, Badcock, Ceely, etc., have left no doubt in the mind of any unprejudiced and competent judge that the so-called "cow-pox" is no disease of the cow, but human smallpox profoundly modified by its passage, directly or indirectly, through the bovine organism. And the repetition of the bovination, though it may eliminate syphilis (which with reasonable care will not be present), cannot *revivify* the lymph, but rather the reverse. If the old strains of lymph are becoming more or less effete, we have but to start *de novo* with the variolation of cows to procure a lymph as lasting in its effects as that of Jenner.

At Hamburg it is found that the percentage of successful revaccination of children on leaving school has lately suddenly fallen from over 96 per cent., which obtains throughout the empire, to about 64 per cent., with the same lymph and in the hands of the same operators, owing to the fact that the great majority of those vaccinated in infancy with Voigt's "new" lymph of 1881–82, are still quite insusceptible of revaccination.

PUBLIC HEALTH LEGISLATION.

1. Public Health (Scotland) Act.

Only one Act of any importance was added to the statute book during the session of 1897, viz., "The Public Health (Scotland) Act," which, so far as it incorporates many of the provisions of the English law, is an improvement on that which it supersedes; but it is due only to the strenuous exertions of **Sir Walter Foster, *Dr. Farquharson*, Sir W. Priestley, Mr. Bryce,** and **Capt. Sinclair** that it is

not a discredit to the Government. As originally drafted by the Lord Advocate and his Scottish colleagues, it was retrograde and reactionary, an undisguised attempt from first to last to discredit the Medical Officer of Health, even to the extent of depriving him of the latter and distinctive feature of his title, and to dispense with the diploma in public health already required of those appointed to counties and the larger burghs, by which they hold a position above that of the Poor Law surgeon as scientific experts rather than medical practitioners undertaking certain additional functions. At the same time, the sanitary inspector, who, in Scotland, already ranks as a co-ordinate and independent official, in no way subordinated to either the Medical Officer of Health or the Engineer and Surveyor, and is not bound to render them any assistance or information, save as an act of courtesy, would have been further empowered to exercise powers demanding special professional knowledge, and have been raised to the exalted position of supreme Director of the Public Health, though no diploma, qualification, or technical experience—not even that of a plumber—was to be demanded of him. This disaster was indeed averted by the exertions of the members we have named and the common-sense of the majority of the House; but the Lord Advocate was successful in defeating an amendment by Captain Sinclair to add to Clause 15 that it should be the duty of the Medical Officer of Health "to superintend and enforce the provisions of the Act," on the plea that "he would thus be placed above the Sanitary Authority, whose servant he was," forgetful of the fact that the very words were borrowed from the Burgh Police Act, where they occur as a definition of the duties of the sanitary inspector!

2. During the session two Bills for amending the **Sale of Foods and Drugs Acts** were introduced—one by the Government, which was withdrawn, and another, which shared the usual fate of private members' bills. The former was so weak that its withdrawal was no loss; but the latter, with a little amendment, would have been almost perfect. Besides revising the penal clauses, it gave a new definition of "food," so as to include articles—as baking powder—"used in the preparation of foods," or for flavouring, though not eaten as such. It authorised the taking of samples in transit, and in ships, docks, warehouses, and other places where samples cannot be obtained in the way of purchase, thus enabling the authorities to proceed against the wholesale dealers direct, and prohibited the importation of articles already adulterated abroad.

It fixed one sample to each thousand of the population in a

district as the minimum that must be analysed annually, and instituted a new order of food inspectors qualified by examination or otherwise. But the most important provision of the Bill was the creation of a Board of Reference composed of experts nominated by the Government and by the several medical, chemical, and similar corporations and the Chambers of Commerce, with extensive consultative powers, to advise as to the qualifications of analysts and inspectors, to interpret the law as to permissible dilution, deterioration, mixtures, so-called "prepared" foods, the use of preservatives, etc., and all matters not explicitly provided for in the Act. The few amendments to which I alluded as sufficing to make the Bill nearly perfect would be the application to the retail trade of the method of straightforward entrance and seizure of suspected articles, as is the procedure under the Italian law, which is provided for in the Bill in the case of the wholesale dealer, instead of the existing practice of mock purchases, under which the man who offends in ignorance most often suffers, while the astute and really fraudulent tradesman too frequently escapes detection, and which is absolutely demoralising to the inspector who is compelled to resort to artifices and lies calculated to elicit public sympathy with the offender.

Another unsuccessful Bill was one to amend the Public Health Act, 1875, which contained some excellent provisions as to dairies, etc., but had the usual defect of being "optional," and, even if adopted, was "enabling" only.

3. Treatment of sewage.

The once burning question of the disposal of the sewage of London, though as far as ever from a really satisfactory solution, has, thanks to certain palliative measures, passed into a state of quiescence. The cry now comes from Lancashire, where the consequences of the locking and weiring up of the Irwell, or, as it must now be called, the Manchester Ship Canal, are felt to be becoming intolerable. It, no doubt, gives a great commercial advantage when sea-going steamers ascend rivers like the Rhine without transhipment of cargo between London and Köln, and the Suez Canal has conferred untold benefits on trade and on colonial administration; but the mighty flow of the Rhine is unchecked by locks, and the Suez Canal receives little or no sewage, whereas the Irwell, long a byword for its foulness, is now converted into a continuous series of cesspits, the sewage in which is already so concentrated that aërobic, and so charged with chemicals from factory wastes that many anaërobic, bacteria are unable to perform the process *commonly*, but inaccurately, termed the self-purification of water.

It is, in fact, fouler than the crude sewage of Salford, at least of the residential quarters, and the large admixture of chemicals precludes its treatment, as urged by the Local Government Board, by irrigation, since it would be destructive of all vegetation; and the dwellers on either shore of the Mersey estuary protest against the scheme of the Joint Committee for the discharge of the crude sewage of the entire district into a tidal and almost a landlocked basin, which the mass of water coming down at the ebb is wholly insufficient to cleanse, while the chemical treatment of the sewage so as to produce a fairly inoffensive effluent would involve a heavy annual expenditure for working expenses over and above the enormous initial outlay on construction. It does not appear to have occurred to the parties concerned that the crude sewage, including the sludge, might, together with the dredgings from the bed of the river, be employed in the reclamation of the flats which constitute so large a part of such estuaries, if sections were from time to time enclosed by sea-walls perforated for the passage of the effluent, which would have thus undergone sufficient filtration, and, provided the acid or other injurious factory wastes were excluded, the foreshore would in course of years be transformed into dry land fit for pasture or arable cultivation. There are many thousands of acres at different places on the English coasts and adjacent to the mouths of rivers available for the utilisation of sewage in their reclamation from the sea, and the concurrent improvement of the navigable reaches of the rivers by narrowing and deepening of their channels.

4. The septic tank method.

Donald Cameron, the Borough Engineer of Exeter, has been during the past two years carrying out an important experiment in the treatment of the sewage of some 2,400 of the population of that city which promises to be of the greatest value in places where the local circumstances preclude the ideal method of utilisation on the land. In irrigation systems the purification is effected by means of the aërobic nitrifying bacteria in the superficial soil, or, as Dr. Poore calls it, the "living earth." The function of these is to oxidise the nitrogenous or albuminoid matters into nitrous and nitric acid, which, combining with the earthy bases in the soil, form nitrates fitted for the food of plants. But when a large volume of dilute sewage is stored in an impervious and covered cesspool or tank in a state of comparative rest, any free oxygen it may have contained is speedily absorbed, gases of the methane type and some gaseous sulphur compounds are evolved, and the decomposition of the suspended albuminous

matter is taken up by anaërobic bacteria, which peptonise or digest it, converting the insoluble into soluble forms ready to be acted upon by the aërobes of nitrification so soon as the effluent is brought into contact with them. The brown scum 4 in. to 8 in. thick, but never increasing in depth, floating on the surface of a clear fluid, and the insignificant sediment, chiefly composed of sand, are familiar though hitherto imperfectly understood features in the large cesspits of country houses with w.c.'s and abundant water service, whence the gardener pumps the clear and almost inodorous liquid on to his beds and lawns. The disappearance of the solids, and the absence of any increase in the thickness of the scum for months and years, is due to the fact that, as fast as fresh solids rise to the surface those already there are reduced to a soluble form and diffused through the subjacent liquid. Cameron has availed himself of the action of these peptonising microbes, merely substituting for the cesspit and pump a covered tank capable of containing the sewage of twenty-four hours, which, entering at one end and running out at the other, flows at a velocity of $2\frac{1}{2}$ ft. per hour. Before being admitted to the tank it is subjected to coarse straining by a screen which arrests sticks, straws, rags, and such refractory materials, and at a distance of about one-sixth of the length of the tank from that end a submerged wall, reaching to a couple of feet below the surface of the fluid, so as not to interfere with the movement of the scum, divides off a compartment in which the heavier particles, mostly road drift, mud, and other mineral matters sink, and whence they are removed from time to time. The deposit in the main body of the tank was found, after twelve months' work, not to exceed 1 in. to $1\frac{1}{2}$ in. in depth. The outlet, extending the entire width of the tank with a view to secure a uniform flow, is about 18 in. below the surface, so as not to allow the escape of any part of the scum. The effluent, being devoid of free oxygen, is aërated by the simple contrivance of being received in a long trough closed at the ends, over either side of which it flows in a thin sheet or cascade before entering the channel conducting it to the "filters," of which there are six in a series. In these, which are made with graduated limestone, gravel, and coke breeze, the effluent undergoes nitrification as it would on the land; but though the filters are allowed to rest twice in the twenty-four hours nearly as long as they have been at work, and the final effluent may be discharged without sensible offence into a fair-sized river, it would be far safer if it were previously applied to water meadows or cultivated land, being rich in nitrates, and still yielding no inconsiderable amount of albuminoid ammonia,

the nitrifying power of these artificial filters being at first *nil*, and even after long use far inferior to that of the "living earth."

5. Denitrifying bacteria.

Weissenberg in the *Arch. f. Hyg.*, vol. xxx., Bd. 3, has published some interesting researches on a class of bacteria hitherto unrecognised, whose function is further to break up those nitrates that have escaped absorption by plants with the liberation of nitrogen, the nascent oxygen exerting a powerful oxidising action on organic matter still present as such in the soil.

MEDICAL JURISPRUDENCE.

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1. The dangers of chlorate of potassium.

It is as well that medical men should be reminded of the fact that chlorate of potassium is not the harmless drug that it is commonly supposed to be by the general public. Chlorate of potassium may be a very active drug, even when used in moderate doses. It has a peculiar action on the blood, and causes a dissolution of the red corpuscles, accompanied by conversion of the hæmoglobin into methæmoglobin. It thus may give rise to nephritis and hæmoglobinuria, and, in addition, the drug is a powerful cardiac depressant. Two cases of death from chlorate of potassium poisoning have been recorded (*Med. Press and Circ.*, July 28, 1897) during 1897. One case occurred at Morpeth, where a young man sucked compressed lozenges of the drug with the object of improving his voice for singing. After taking about two-thirds of an ounce of the drug, death resulted from cardiac paralysis. The other case is reported from Vienna. A young woman purchased about three-quarters of an ounce of potassium chlorate, which amount was taken gradually, extending over a period of a few days, at the end of which death occurred from poisoning by that drug.

Treatment.—Cardiac tonics and stimulants should be administered, such as digitalis, strychnine, and ether. If the kidneys are attacked, vapour baths should be employed, and dry or wet cupping of the loins may advantageously be resorted to.

2. Chronic lead poisoning.

Three cases of chronic plumbism have been reported by Pels (*Centralbl. f. inn. Med.*, June 12, 1897) in which the lead was derived from unusual sources. One case occurred in a shoemaker, who was in the habit of holding in his mouth the nails he used at his work. The nails contained lead, hence the poisoning. A second case was that of a cigar roller, who was in the habit of rolling the cigars on a board covered with tin. He

cut the cigars with a knife on the metal surface, and was accustomed to put the knife back every time into his mouth, as it worked best when moistened. The tin surface contained lead, and was indented with the cuts of the knife. The third case was that of a diamond worker who had to fix the diamonds in a mass of lead, which he worked with the fingers, previously moistening them from the mouth.

2a. Simple method for the detection of lead in the urine.

J. H. Abram (*Lancet*, Jan. 16, 1897) draws attention to a very easy method for detecting small quantities of lead in the urine without necessitating the trouble of previously destroying the organic matter of the urine. The process is described in **Von Jaksch's** "Clinical Diagnosis." A strip of pure magnesium is placed in the urine, and ammonium oxalate in the proportion of about 3 grains to 1 fluid ounce is added. If lead be present, it is deposited on the magnesium in from half an hour to a few hours. The slip is then washed and dried, and the presence of the lead proved (*a*) by warming a portion of the slip with a fragment of iodine, when the yellow iodide of lead is formed; (*b*) by dissolving the deposit from the other portion in nitric acid and applying the usual tests. This test may prove very valuable in establishing a diagnosis, as chronic plumbism is apt to develop very insidiously, and, moreover, the blue line on the gums, which possesses such peculiar diagnostic import, may be absent if there is no tartar on the teeth.

3. Salivation from cyanide gauze dressing.

W. T. Thomas (*Lancet*, Oct. 24, 1896) reports a case illustrating the production of mercurialisation by absorption of mercury from a cyanide gauze dressing applied to a large wound. A woman had been operated on for a carbuncle between the shoulders, necessitating the production of a wound 9 inches by 5½ inches. The wound was at first packed with sponges wrapped in cyanide gauze, and afterwards a bran poultice (in muslin), well dusted with powdered borax, was applied over a thin layer of cyanide gauze. On the tenth day from the operation the patient's temperature ran up to 102° F., the breath became fœtid, the gums were inflamed and suppurating, two of the teeth were loose, and ulcers had formed on the inside of the cheeks and on the tongue. Next day salivation was profuse. These symptoms of mercurial poisoning gradually subsided on the withdrawal of the cyanide dressing. It was found, on investigation, that the cyanide salt is one quarter more soluble in borax solution than in water, so that it is probable that the borax applied between the

poultice and the cyanide gauze facilitated the solution of the mercury salt from the gauze. It was also found that carbolic lotion increased the solubility of the cyanides present in the gauze. These two facts should be borne in mind by surgeons, as it is obviously inadvisable to employ either borax or carbolic lotion along with a cyanide gauze dressing.

4. Opium poisoning and permanganate of potassium.

Owing to the great advantages possessed by this new antidote for opium and morphine poisoning over all other antidotes, it may be as well to refer the reader to the full instructions given on p. 439 of "The Year-Book of Treatment" for last year for the treatment of opium and morphine poisoning by the administration of permanganate. During the past year numerous cases of its success as an antidote have been recorded. One remarkable case is that reported by **R. Nitch-Smith** (*Lancet*, Oct. 30, 1897) of a man who took 1 fluid ounce of laudanum—equivalent to 33 grains of opium. The permanganate treatment was not employed till five hours had elapsed from the time of taking the poison, yet after its use the patient made a rapid and complete recovery.

5. Cure of the morphine habit by acute bromidism.

The cure of this habit, even when of many years' duration, by the production of acute bromidism appears to be promising from the experiences of the following cases. In these cases the rapid administration of large doses of sodium bromide quickly and permanently obliterated the desire for morphine without the usual subsequent suffering, and without creating another drug habit. The cases are recorded by **Neil MacLeod** (*Brit. Med. Journ.*, July 10 1897), and the discovery was made by him originally owing to a large quantity of bromide being taken by mistake by a patient who had no desire to be cured. The patient, a lady, aged thirty-two, had for seven years been addicted to the morphine habit, at the end of which time a mixture was ordered her containing sodium bromide for the relief of an attack of migraine. Within forty-eight hours she had taken (presumably by mistake) 18 drachms of the bromide, after which she lapsed into unconsciousness and could not be roused. The condition was one of acute bromidism. For the first four days no intellectual or volitional effort was made, and only a little milk was swallowed daily. During these four days morphine was *injected*, amounting to a grain and a half each day. On the *three subsequent* days 30-grain doses of sodium bromide were

given four times a day, and on the fourth day one 30-grain dose of chloralamide, after which no more drugs were administered. The patient made a gradual recovery without any recurrence of the desire for morphine. Thirteen months later no return to the morphine habit had occurred.

The second case was that of a man, aged thirty-six, who for four years had been a victim to the morphine habit, sometimes injecting as much as 60 grains in the day. The treatment was as follows: For the first thirteen days only small but gradually diminishing doses of morphine were injected three times a day—the doses totalled on each consecutive day in grains $1\frac{1}{2}$, $1\frac{1}{2}$, 1, 1, $1\frac{1}{2}$, $1\frac{1}{2}$, 1, $\frac{3}{4}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, and $\frac{3}{16}$. At the same time the bromide treatment was commenced and continued for eighteen days, the amount of sodium bromide being gradually increased from 120 to 480 grains a day. After the eighteenth day, when acute bromidism was produced, no drug of any kind was given. The patient practically slept for three days, taking only a little milk every two hours, after which he gradually recovered. Three weeks later he was quite well, and had completely lost the craving for morphine.

The advantages claimed for the method of treatment are:—

(1) Absence of suffering entailed by stopping the drug.

(2) Inability of the patient to obtain morphine, owing to his being rendered powerless.

(3) No necessity for special attendants or establishment.

(4) Absence of violence or excitement while under treatment.

It is suggested that in the treatment of future cases the morphine should be reduced by halving the dose each day, not giving it if not asked for, and that the bromide should be rapidly pushed till the stage of torpor is reached, not, however, going beyond the stage of marked torpor.

6. Gastric disorder during the treatment of morphinism.

Erlenmeyer (*Prog. Médical*, Aug. 1, 1896) finds that the sudden deprivation of a morphinomaniac's drug is associated with the symptoms of hyperacid dyspepsia, due to the presence of an excess of hydrochloric acid in the stomach. The reason of this probably is that, since morphine injected under the skin is known to be largely excreted into the stomach, it exerts there a narcotic influence, both inhibiting the secretion of the gastric glands and numbing the sensibility of nerve endings. When the drug is suddenly removed exactly the reverse changes occur; an excess of acid is secreted, and by its effect on the hypersensitive nerve endings causes reflex nervous disturbances. To neutralise this excess of hydrochloric acid Erlenmeyer recommends

the administration of sodium bicarbonate during the period of the withdrawal of the morphine.

7. Acute cocaine intoxication.

Stoerk (*Wien. med. Woch.*, Oct. 24, 1896) relates four cases of operations on the larynx and nose, in which severe toxic effects resulted from the employment of small quantities of cocaine as a local anæsthetic. The symptoms in each case consisted of convulsions (lasting for some hours) and severe collapse. Cocaine intoxication is largely due to idiosyncrasy. If convulsions occur, the inhalation of chloroform should be resorted to. To counteract the collapse brandy should be administered, ammonia should be applied to the nostrils, and 10 minims of solution of ammonia given internally every five minutes till the heart is recovering its normal action. It is doubtful whether nitrite of amyl is of much use.

8. Useful diagnostic symptom of chronic cocaine poisoning.

Rybakoff (*Neurol. Centralbl.*, Aug., 1896) draws attention to the diagnostic value of the symptom of chronic cocaine poisoning described by **Magnan**. This is a hallucination of common sensation. The patient complains of feeling some foreign body under the skin. The complaint usually is of some small, more or less rounded body felt under the skin, or of bodies like grains of sand, worms, crystals, etc., situated just beneath the skin. The diagnostic value of Magnan's symptom is that it seems to occur only in connection with chronic cocaine poisoning, whereas other symptoms of that affection or habit occur also in alcoholism and with other poisons.

9. Chronic sulphonal poisoning.

Two cases of chronic sulphonal poisoning, one ending fatally, have been recently recorded. **Schulz** (*Neurol. Centralbl.*, Oct., 1896) reports the case of a woman, aged fifty-nine, who for some years had suffered from headaches, constipation, and hysteria. On account of sleeplessness she had been taking sulphonal in doses of 15 grains, and had taken altogether about half an ounce within a month. At the end of this time she was suffering from obstinate constipation, with vomiting, and there was a smell of acetone in the breath. The urine was normal. Twenty-five grains of sulphonal were given, and the following day the urine was scanty and brownish-red in colour from the presence of hæmatoporphyrin. The patient became weaker day by day, and expired at the end of seven days, during which time the urine continued brownish-red in colour. The toxic results were probably due to retention of the sulphonal in the system, owing

to the obstinate constipation. Great caution should therefore be exercised in ordering sulphonal to patients suffering from constipation, and when it is used a careful watch should be kept on the urine for hæmatoporphyrin.

The second case is reported by **F. P. Hearder** (*Lancet*, Nov. 14, 1896), and is also an example of the toxic effects that may be produced by the administration of comparatively small doses of sulphonal. A man, forty-three years of age, who was suffering from active melancholia, was ordered 15 grains of sulphonal three times a day. On the sixth day the urine was noticed to be becoming scanty and high-coloured, and the sulphonal was, consequently, at once stopped. On the following day only 5 ounces of urine were passed, of the colour of porter, and containing a large amount of albumin. The patient was somewhat sleepy, and there was slight œdema of the eyelids. Under treatment with saline purges and diuretics the patient ultimately made a good recovery. This case also illustrates the necessity of keeping a watch on the urine during the administration of sulphonal.

10. Severe toxic effects of a small dose of antipyrin.

E. Webster (*Lancet*, Jan. 30, 1897) relates a remarkable case of severe poisoning that occurred within a few minutes of taking a small dose of antipyrin. A girl, aged nineteen years, suffering from headache, took a draught containing 5 grains of antipyrin. Within ten minutes of taking it she was seized with the following symptoms :—Cold shivers, severe dyspnœa, great swelling of the face, especially about the eyes, and a scarlatinal-like rash over the body, with wheals resembling those of urticaria, varying in size from that of a small papule to that of a five-shilling piece. The temperature was subnormal, and the pulse slow, weak, and very intermittent. The treatment consisted in the application of warmth, and the administration of whisky, strychnine, and digitalis. Recovery gradually took place, but the rash took about thirty hours to disappear finally.

11. Pyrogallic acid poisoning.

The following case, which is probably the second death from pyrogallic acid taken internally, is recorded by **F. B. Reilly** (*Brit. Med. Journ.*, July 10, 1897). A woman, aged thirty-two years, took about half an ounce of pyrogallic acid dissolved in water. When seen, she was extremely cyanosed, there was intense cardiac depression, and vomiting had once occurred; diarrhœa, hæmoglobinuria, and headache followed. On the third day she became comatose, and died sixty-eight hours after the commencement of symptoms. The treatment consisted in the administration of

ether, ammonium carbonate, and digitalis, and the application of warmth. The dose taken was a large one. In addition to the employment of stimulants and warmth, it is always advisable to give repeated inhalations of oxygen, owing to the powerful reducing action that pyrogallic acid exerts on the blood and tissues.

12. Treatment of snake bite with Calmette's antivenomous serum.

Two cases of successful treatment of snake bite have been recorded. **H. P. Keatinge** and **M. A. Ruffer** (*Brit. Med. Journ.*, Jan. 2, 1897) relate the case of a girl, thirteen years of age, who was bitten in the forearm in Egypt by a snake believed to be the Egyptian cobra. She became unconscious almost at once, and when seen later was cold and collapsed, with sunken eyes and an imperceptible pulse. Twenty c.cm. of antivenomous serum were injected under the skin of the abdomen, and three hours later 10 c.cm. more were injected. From that time she gradually recovered. Neither rash nor joint pains were noticed afterwards. The only complication was the formation of a small abscess around the site of the bite, which might possibly have been caused by the snake poison, but was more probably due to infection with Nile mud, as she was first treated by the village barber, who made several small incisions into the whole arm, and then thickly coated the limb over with Nile mud.

The second case is recorded by **S. J. Rennie** (*Brit. Med. Journ.*, Nov. 21, 1896) and occurred in India. A boy, aged eleven years, was bitten in the right foot by a snake. In three minutes' time he was under treatment. 8 c.cm. of antivenomous serum were at once injected into the subcutaneous tissue of the abdomen, while at the same time the wounds and their immediate neighbourhood were treated with a hypodermic solution of potassium permanganate, after which they were carefully washed and dressed. The patient recovered without a bad symptom. The snake was, unfortunately, not killed, but from the description given of it by the boy, and by two men who saw it bite the boy, as well as the characteristics of the wounds, there was little doubt that it was a krait, one of the most deadly and most dangerous of the Indian snakes.

13. A new method for the distinction of real from apparent death.

Séberin Icard (*La Mort Réelle et la Mort Apparente*, Paris: Félix Alcan, 1897) describes a method which he claims may be of use in distinguishing real from apparent death. It consists in the hypodermic or intravenous injection of a substance, and subsequently ascertaining whether the substance has been dispersed

throughout the system or not. If it has, then the circulation persists and life continues, although the beating of the heart may not be detected by auscultation. The process is carried out as follows :—One gramme of fluorescein is dissolved, with an equal weight of sodium carbonate, in 8 c.cm. of water, and the whole quantity is then injected subcutaneously. If the circulation is persisting, the skin and mucous membranes after a very few minutes assume a yellowish-green colour, and about twenty minutes after injection the portion of the eye within the iris assumes a green colour from penetration of the fluorescein into the vitreous and aqueous humours. In the blood the fluorescein may be detected by the following method :—One or two threads of cotton are passed under the skin in a similar method to a seton, and, when saturated with blood, are transferred to a test-tube and boiled with a little water. As the liquid clears, the green colour of the fluorescein becomes evident if that body has been absorbed into the blood. It is stated that the injection of this quantity of fluorescein is unattended with danger, supposing the person to be alive.

It is possible that this test might be of use on very rare occasions when there is an element of doubt as to the reality of death.

SUMMARY OF THE THERAPEUTICS OF THE YEAR 1896-97,

CHIEFLY WITH REFERENCE TO NEW REMEDIES.

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During the past year comparatively few new remedies have been introduced, and, notwithstanding the interesting nature of the subjects appointed for discussion at various important meetings, the course of debate in most instances showed that there was a certain distrust of new remedies intended to deal with a single symptom, and a wholesome reliance upon modes of treatment which attack causes rather than results. The various forms of serum treatment have been employed with increasing confidence; diphtheria and tetanus continue to furnish matter for clinical reports in favour of the respective antitoxins, while the work of Koch has been further extended upon a more certain basis. Some of the older remedies have, as usual, been found to produce toxic symptoms under exceptional conditions, and it has been deemed desirable to allude to these briefly, since they afford valuable indications of possible dangers. For the present, the research for a satisfactory local anæsthetic appears to absorb a great deal of interest; and though cocaine still holds its own, its position has been assailed by numerous other candidates for favour. Eucaine, which was at first much employed, has been gradually falling into disfavour, while holocaine and other local anæsthetics have been introduced.

A.—TOXIC EFFECTS WITH OLDER REMEDIES

Salicylate of soda.

Toxic symptoms were produced in a lady aged seventy-five, by a single dose of 10 gr. of salicylate of soda (*Brit. Med. Journ., April 17, 1897*). This dose was taken at night. On the following

morning the patient's lips were thickly swollen and œdematous, and there was an erythematous blush on the skin around the mouth. Her gums were swollen, and she complained of burning sensations in the mouth. She stated that on many previous occasions she had suffered from similar symptoms after taking salicylate of soda.

Comparable with the last case is one narrated in the *Brit. Med. Journ.*, Feb. 6, 1897, in which marked toxic effects resulted consequent upon a relatively small dose of sodium salicylate. After taking two doses of 10 gr. each, the patient complained of severe headache, ringing in the ears, giddiness, and lightness of head. The patient was apparently not hysterical, and later it was found that 5 gr. produced similar but less severe effects.

Poisoning by antipyrin.

A curious case, in which severe symptoms were produced by a small dose, is narrated by **Edwin Webster** (*Lancet*, Jan. 30, 1897). He had prescribed a draught containing 5 gr. of antipyrin, 7 gr. of bromide of potassium, 1 dr. of compound spirit of ammonia, and 1 oz. of water. Within ten minutes after taking this draught the patient suffered from cold shivers and dyspnœa. The face was swollen, so that there was difficulty in opening the eyes, and the body was covered with a bright red rash, somewhat like that of scarlet fever, and resembling urticaria in presenting wheals of fairly large size. The temperature fell to 97°. The pulse was intermittent: 50. This condition lasted some seven or eight hours; and although better on the following day, the rash persisted for thirty hours. This case merits notice for the rapid onset of the attack, the quick appearance of the rash, and the severity of the symptoms from such a small dose of antipyrin.

Poisoning by quinine.

Toxic symptoms with quinine have been noted by **Gresswell** (*Lancet*, May 1, 1897). The dose taken was two teaspoonfuls, or perhaps rather more, which had been dissolved in acid and taken after meals. The result was that the patient became prostrated within a few hours, was unable to speak, and exhibited marked pallor. These symptoms were shortly followed by vomiting, after which the hands and face were extremely pale; the pulse quick and irregular, and over 120. Although the patient remained speechless and quiescent for over six hours, she was not quite unconscious, and subsequently said that she had been able to know something of what had been going on around her, although unable to speak or hear. Deafness continued until the patient fell asleep, and to some extent persisted till the next day. The

account given by the patient of the onset was that she first felt faint, then dizzy, and was then sick, after which she became unconscious and remained free from pain. The deafness appears to have come on rather suddenly, as if from a blow.

Acute sulphonal poisoning.

A case of acute sulphonal poisoning which terminated fatally is described by **Hoppe Seyler** and **Ritter** (*Münch. med. Woch.*, April 6, 1897). A young man took 50 gr. to produce sleep, and seventy hours later died from increasing cardiac weakness. No trace of hæmatoporphyrin was ever found in the urine, but unchanged sulphonal was present. Although the reflexes were abolished during life, and coma was present, there was no vomiting or diarrhœa. The *post-mortem* changes mainly consisted in engorgement of the digestive tract and of the respiratory tract, with some patches of broncho-pneumonia.

Recovery after large doses of chlorodyne and sulphonal.

Keith Campbell (*Lancet*, March 6, 1897) describes a recovery after what appears to have been a very large dose of chlorodyne and sulphonal. According to the patient's statement, fully 1 oz. of chlorodyne and 250 gr. of sulphonal were taken. Although it is to be regretted that there was no opportunity of confirming this statement, it is none the less remarkable that the patient fell asleep in the afternoon of Monday, and remembered nothing more till the morning of the following Thursday. Some four days later he had considerable nervous breakdown, and looked ill and worn, but in the course of a week of treatment his discomforts disappeared. Campbell compares this case with two others in which sleep lasted for a lengthened period after a large dose of sulphonal. In the other cases referred to it was possible to estimate the amount of sulphonal that had been taken.

Treatment of morphine habit of long standing.

N. MacLeod, of Shanghai, writes favourably of his results in treating morphine habit of long standing by large doses of bromides, sufficient to produce symptoms of acute bromism. He gives details of two cases treated in this way, and claims for this method of treatment that it did away with the suffering entailed by stopping the drug; that, owing to the sleep produced, the patient was powerless to bribe the attendants; that no violence or excitement was likely to result from bromide, nor was it probable that a taste for the drug would be developed. In the two cases referred to the bromide of sodium was employed in doses sufficient to produce complete torpor. The bromide appears to have been used for ten days in one case, and for a

fortnight in the other. A marked bromide rash upon the forehead was produced in one case.

Decomposition of chloroform.

David Newman and **William Ramsay** have recently (*Lancet*, Jan. 23, 1897) been investigating the action of freshly prepared chloroform, as compared with that which has been kept for some little time, and they find that the former is more reliable as an anæsthetic and less likely to produce sickness after administration. They also consider that the risks of anæsthesia are increased by the decomposition of chloroform when exposed to air and light for any considerable time. Perfectly pure chloroform is less stable than chloroform containing alcohol; and there appears to be some evidence that the effect of this drug as an anæsthetic is certainly not impaired by the admixture of small quantities of alcohol, which enables it to resist decomposition.

Belladonna poisoning.

Unusual symptoms were produced in a man, aged forty-five, who had accidentally taken a little over an ounce of glycerinum belladonnæ (*Brit. Med. Journ.*, May 8, 1897). This was taken at about 5.30 a.m., and caused considerable discomfort but no vomiting. There was delirium of the noisy and active type, and the pulse was very feeble. He subsequently became comatose, and there were jerking movements of the limbs, stertorous breathing, dryness of the mouth, and widely dilated pupils. He was treated with hypodermic injections of apomorphine, and later with injections of morphine. The former caused vomiting, and while under the influence of the latter delirium ceased and sleep was produced. After his recovery, he stated that the first symptom he had experienced was a feeling of dizziness, his legs going from under him, and a mist coming before his eyes. He was completely unconscious of his symptoms for eleven hours. No flushing of the skin nor rash was observed during the time he remained under treatment. The interesting feature in connection with this case was the prominence of muscular incoordination, which affected both arms and legs.

It is really rather late in the day to suggest that the internal use of atropine should be discontinued, but this question has been raised by **Lépine** (*Sem. Méd.*, Nov. 25, 1896), who maintains that more deaths have followed medicinal doses of atropine than of any other drug. With all gravity, therefore, he maintains that, when possible, other drugs should be substituted for it, and he proceeds to enumerate the conditions under which he thinks that the drug may still be employed. It may relieve anxiety to say that this list is sufficiently long to include all those

conditions in which there is any temptation to prescribe atropine.

Picric acid.

It will be remembered that on former occasions picric acid has been recommended as a local application in the treatment of burns or other forms of dermatitis. It is important, therefore, to recall the fact that, in exceptional cases, picric acid has caused prostration and all symptoms of carboluria, with very dark urine (*Brit. Med. Journ.*, Feb. 6, 1897). Before this ensued, the drug had been used upon the surface for ten days, although it is not stated in what strength. The possibility of untoward occurrences must be borne in mind, since there is a distinct tendency to increase the local use of picric acid. In the *British Medical Journal* for Feb. 20, 1897, there is a short paper on some of the surgical uses of picric acid, in which it is recommended as being most useful in allaying the irritation and stopping the discharge from eczematous and ulcerated surfaces, as well as in promoting the healing of recent wounds. It is there recommended that gauze soaked in picric solution should be applied to bleeding surfaces, to act as an astringent and antiseptic.

B.—NEW REMEDIES.

I.—Local Anæsthetics.

Eucaine.—In the account given last year of this new rival of cocaine, reference was made to its action as a local anæsthetic when applied to the conjunctiva, but it was noted that it produced local hyperæmia, and that in laryngology, at least, anæsthesia was preceded by burning sensations. I ventured then to suggest that its future use would depend largely upon the extent to which this pain could be prevented, perhaps by association with some other drug. This prediction has, unfortunately, been verified; eucaine has been largely used during the year, but, on account of the preliminary pain it induces, it has not succeeded in replacing cocaine, in spite of the disadvantages possessed by the latter. The literature connected with eucaine has been growing considerably, and it may be well, therefore, to summarise recent experiences and investigations connected with it.

The late **Professor Charteris** last year compared experimentally the toxic influence of eucaine with that of cocaine (*vide* "Year-Book of Treatment" for 1897, p. 462). In conjunction with

MacClellan (*Lancet*, Feb. 27, 1897) he further investigated the physiological action of eucaine, and they found that the lethal dose of eucaine is ·09 grm. per kilogramme of body-weight; that of cocaine being ·068. While larger quantities of the former are required to produce toxic effects, the toxic symptoms take longer to develop. **Professor Pouchet** maintains that eucaine is a powerful cardiac depressent, and may produce sudden death without warning.

Professor Hobday (*Journ. of Compar. Pathol. and Therap.*, March, 1897) has, at the Royal Veterinary College, been investigating the use of eucaine as a local anæsthetic. His results confirmed the opinion that the toxic dose is somewhat larger than that of cocaine. For operations on the cornea he finds that eucaine compares favourably with cocaine, although anæsthesia is not produced quite so rapidly. He recommends combining the two drugs; and for hypodermic injections he employs a solution consisting of ½ gr. of each to the drachm of water.

Experimenting with a 1 per cent. solution of hydrochlorate of eucaine (*Klin. Monat. f. Augen.*, April, 1897), **Dolganoff** finds that anæsthesia is complete in about one and a half to two minutes. First the cornea becomes anæsthetic, then the conjunctiva of the globe, and lastly that covering the eyelids. Dolganoff finds that it produces great pain, on account of which some patients have refused to have a second drop applied. It also causes, in his experience, marked conjunctival injection, with some œdema of the tissues. The pupils are generally unaffected, though they may be either contracted or slightly dilated. The intra-ocular pressure slightly falls under its influence. Dolganoff thinks the drug is not likely to give place to cocaine.

Eucaine has been employed by **Surg.-Capt. Maynard** (*Indian Med. Gazette*, Feb., 1897) in ophthalmic surgery. It produced pain, which usually lasted from a half to two minutes, and ceased as suddenly as it commenced. Anæsthesia came on in from one to three and a half minutes, usually within one minute, becoming complete within three. In no case did the anæsthesia pass off until the operation was completed. In two cases eucaine failed to produce anæsthesia of the conjunctiva, although the cornea became anæsthetic. He employed 3 drops of a 10 per cent. solution, and he found that a 2 per cent. solution caused as much pain, while the anæsthesia was less complete and less lasting.

Apart from the irritating action of eucaine, it has been stated that this drug exerts a destructive action upon the epithelium of the cornea and conjunctiva (*Münch. med. Woch.*, 1896, No. 51), and it has also been said to harden the cornea and conjunctiva to

such an extent that it is difficult to pass suture needles through them.

In the *Univ. Med. Mag.* (Philadelphia), Nov., 1896, appears an account of its employment as a local anæsthetic in many cases of minor operations. It is there claimed that eucaine is rapid in action, that the anæsthesia which it produces is of considerable duration, that it causes no serious after-effects, and that its solutions may be rendered aseptic. One of the drawbacks that is mentioned occasionally in connection with eucaine is that it causes congestion of the parts to which it is applied.

The use of eucaine as a local anæsthetic in the surgery of the throat, nose, and ear has been considered in some detail in the *Brit. Med. Journ.*, Jan. 16, 1897, where a valuable summary of the chemistry and pharmacology has also been included. It is there asserted that in operations on the nose the hæmorrhage which so often results from cocaine anæsthesia is absent when eucaine is employed. In some cases a considerable increase of saliva appears to have followed the use of eucaine, and this observation, if confirmed, will probably detract from the use of eucaine in operations upon the oral cavity. In connection with the surgery of the nose, it is improbable that eucaine can wholly replace cocaine, since it does not possess the power of reducing the size of the turbinate bodies, which is such a valuable aid to diagnosis.

Although most observers are thus agreed about the engorgement due to eucaine, **Gibb** (*Philadelphia Polyclinic*, Jan. 23, 1897) states that he finds that eucaine is nearly, if not quite, as effective as cocaine in reducing engorged turbinates. He also considers that it is superior to cocaine in being less likely to produce toxic symptoms, and in causing far less unpleasant subjective sensations.

Holocaine (*Deut. med. Woch.*, March 11, 1897).—This new anæsthetic is closely allied to phenacetin. Its chloride is sparingly soluble in cold water, and crystallises in white needles. When applied to the conjunctiva it produces anæsthesia which lasts from five to fifteen minutes, and it does not appear to affect intra-ocular tension nor the size of the pupil. Anæsthesia occurs within a minute, after a slight feeling of burning.

In another account it is stated that a 1 per cent. solution dropped into a rabbit's eye causes no irritation. The drug has no effect on the pupil, on accommodation, or on the blood vessels. It is detrimental to the lower forms of life, and acts as a protoplasmic poison (*Klin. Monat. f. Augen*, April 15, 1897). For ophthalmic practice a 1 per cent. solution is recommended, one or two drops producing anæsthesia in forty or fifty seconds. At

first it causes some burning sensations, which pass off in thirty to forty seconds. A slight conjunctival injection is also produced, but this is, too, of a transitory nature. It is thought probable that it causes less injury to the epithelium of the cornea than is produced by cocaine, since it does not constrict the blood vessels. The rapidity of its action is also an advantage.

Gutmann considers that it should not be used subcutaneously, as toxic symptoms have been produced by a small dose in a rabbit; and **Loewenstamm** (*Therap. Monats.*, May, 1897), as the result of investigations with a 1 per cent. solution, thinks its toxic action is much greater than that of cocaine. When anæsthesia of the conjunctiva does not occur after the second or third application, a sensation of burning is experienced. Hitherto it has been found to be a prompt and long-lasting anæsthetic, with no unpleasant results. On account of its powerful disinfectant properties, the solution does not require boiling before being used.

Brudenell Carter, who last year recorded his experiences with eucaine as an anæsthetic in ophthalmic surgery (*vide* "Year-Book of Treatment" for 1897, p. 461) states that further experience has led him to be somewhat dissatisfied with this drug, on account of the acute pain and smarting which may result from its application to the conjunctiva. He has lately employed holocaine, which enabled him to perform cataract extraction and iridectomy without producing pain. The patient was unconscious of the first incision, and barely conscious of the iridectomy. Carter found there was no action upon either the conjunctival blood vessels, the pupil, or the accommodation, and he thinks that the promptness of action is of distinct advantage. In these observations he confirms the statements made by **Deneffe**, of of Ghent, concerning the anæsthetic value of a 1 per cent. solution of this drug.

Mydrol has been used in ophthalmic work, on account of its power of dilating the pupil, and it is claimed that it has very little effect on accommodation and intra-ocular tension. To some extent it acts as an anodyne. As compared with atropine, it has the disadvantage of being somewhat slow in action (*Bull. des Sc. Méd. de Boulogne*, 1896) (*Merck's Bulletin*).

Anesin is another new local anæsthetic, which has been applied to the conjunctiva, the larynx, pharynx, and nasal mucous membrane. It is said to act rapidly, and not to produce mydriasis. So far no harmful effects have been noted. In addition to its anæsthetic properties, it is credited with hypnotic action when given internally in doses of 0·5 gr. to 1 gr. (*Brit. Med. Journ.*, *Epit.*, Oct. 9, 1897).

Orthoform is the name of a new local anæsthetic, described by **Einhorn** and **Heinz** (*Münch. med. Woch.*, Aug. 24, 1897) as a white light powder devoid of taste and smell, and only sparingly soluble in water. The hydrochlorate is much more soluble, but, from the irritation it produces, it cannot be applied to the conjunctiva, though it relieves the pain of gastric ulcer and of chronic gastric catarrh. Orthoform will not act through the unbroken skin, but it is said to relieve the pain of wounds, burns, and ulcers. Although so sparingly soluble, it produces anæsthesia of the conjunctiva. Its local action on the mouth, nose, and naso-pharynx has yet to be determined.

II.—Antipyretics.

Kryofin.

Under this name a new antipyretic is described by **Eichhorst** (*Deut. med. Woch.*, April 22, 1897). It forms white, odourless, tasteless crystals, which are sparingly soluble in hot water and very little soluble in cold. It is claimed for it that in those cases where it fails to reduce temperature, such remedies as phenacetin, lactophenin, and antipyrin also fail. Sometimes it has caused profuse diaphoresis, and once or twice some cyanosis. It is interesting to find that, even in the original paper which describes the action of this new drug, it is admitted that the diminution in the temperature of the body in fever is not by any means the first thing to be desired.

Pyramidon is a new antipyretic analgesic, a derivative of antipyrin, which is said (*Lyon Méd.*, June 13, 1897) to have been used with great advantage in a case of tabes and severe lightning pains. It is stated that it has also given satisfactory results as an antipyretic in typhoid fever.

III.—Antiseptics.

Chinosol has been found to have marked antiseptic properties (*Therap. Monat.*, Dec., 1896). It is found to hinder decomposition, to check alcoholic and lactic fermentation, and to retard the coagulation of albumin. **Bonnema** has also investigated its action upon bacteria, and he finds that a 5 per cent. solution will arrest the growth of a cultivation of staphylococcus.

Airol, bismuth oxyiodide gallate, which was last year introduced as a substitute for iodoform, has recently been employed in the treatment of diarrhœa. The dose given has varied from 20 cg. to 90 cg. in twenty-four hours. In the few

cases which have been reported it appears to have given good results. According to **Merck**, however, the chief value of airol is as a local astringent and antiseptic, and it has been used in the treatment of wounds, of intertrigo, and also as a local application in gonorrhœa.

Acetanilid.

Grün (*Lancet*, June 12, 1897) lays stress upon the value of acetanilid as an antiseptic, and gives details of certain cases treated with this drug which healed without the formation of pus, and mostly by first intention, although the operations described were often performed under conditions which rendered antiseptic precautions absolutely impossible. He found that in some cases it caused a bluish tinging of the skin, and some blueness of the lips and finger nails. He applies the drug as a powder, when it appears to cause a dry healthy scab, which unites the edges of incised wounds.

Oil of winter green is said to be preferable to salicylate of soda, as an external application in rheumatism, and to act more rapidly, as well as to be free from the liability to produce tinnitus or giddiness (*Lancet*, May 29, 1897). A piece of lint is soaked in the essential oil and applied to the skin; it is then covered with oiled silk, and bandaged so as to prevent evaporation. Similar applications have been recommended for the relief of the lightning pains of locomotor ataxy. The chief objection to the use of oil of winter green in this way is the strong penetrating odour.

IV.—Drugs acting on Nerve Centres.

(*a*) *Stimulants.*

Of the drugs which act upon the nervous system two stand out in high relief and afford opportunities for picturesque descriptions of personal experiences. One of these, **mescal**, is perhaps scarcely to be called a drug, since the curious visual phenomena, or hallucinations, which result from its use are not likely to be of any therapeutic service, though it may, perhaps, be employed as a form of self-indulgence. The other, **cannabinol**, although causing strange, disordered estimation of time, may probably be destined to take the place of other preparations of Indian hemp, which have hitherto given such uncertain results.

Anhelonium Lewinii (*the mescal button*).—It is impossible in these pages to do justice to the fascinating account by **Weir Mitchell** (*Brit. Med. Journ.*, Dec. 5, 1896) of his experiences

under the influence of varying doses of a liquid extract of mescal. Within two hours of taking a dose of 1½ dr., followed an hour later by a little over a drachm, he had a slight sense of exhilaration and a pleasing sense of languor; later this proceeded to yawning and comfortable sleepiness. Then came increased self-confidence and consciousness of power, which, however, proved fallacious. Subjective colour sensations commenced five and a half hours later, and lasted two hours; they consisted at first of stars and delicate floating films of colour—"delightful neutral purples and pinks"—"a slow rain of colours"—"long, hanging lines of vivid light." As a warning to others, he notes that these rainbow delights are expensive, since they entailed headache for two days and a smart attack of gastric distress, and adds significantly that the experience was worth one such headache and indigestion but was not worth a second. Weir Mitchell compares the effects with those he experienced in some ophthalmic megrims.

To this account he appends a statement by **Eshner**, whose experiences were similar but much more unpleasant. Nausea was pronounced, and there was complete anorexia; the colour sensations were not so well marked, and there was a feeling of partial release of inhibition, of relaxation, of restraint, and of repression. In neither account is there any suggestion of therapeutic application of this drug, though Weir Mitchell predicts a perilous reign of the mescal habit when this agent becomes attainable.

Another account of the symptoms of intoxication produced by mescal buttons (*Lancet*, June 5, 1897) will have been read with interest. **Havelock Ellis** says that, in his case, the visions produced were perhaps less wonderful than those of Weir Mitchell. He made an infusion of three buttons, and took it in three portions at intervals of an hour. The first effect was that the headache which had been present for some hours was immediately relieved and speedily disappeared. Slight drowsiness ensued, together with some faintness and difficulty of concentrating the attention. Three and a half hours after taking the first dose, a pale violet shade floated across the field of vision. An hour later visions began to appear with closed eyelids—a confused mass, of kaleidoscopic character. When the eyes were open the visual phenomena included very distinct violet shades and faint green shades. Five hours from the time that it was first taken he experienced olfactory hallucinations. Weir Mitchell was unable to see visions with open eyes, even in the darkest room; under similar conditions Havelock Ellis found it perfectly easy to see them, though they were less brilliant than when the eyes were closed. Ellis,

in summarising his experiences, describes them as a saturnalia of the specific senses, and chiefly as an orgy of vision. It is interesting to note that although he sees a great future before it with those who have a perverted taste for "vision-breeding drugs," he does not point to any probable therapeutic value of mescal. It is to be hoped, however, that in undertaking experiments with this drug, due attention will be paid to the significant fact that both Weir Mitchell and Havelock Ellis, having seen the visions once, have no desire to see them again. "These shows are expensive," and it is well to count the cost.

Active principle of Indian hemp.

C. R. Marshall (*Lancet*, Jan. 23, 1897) gives a very interesting account of his personal experiences in connection with cannabinol. He apologises for the personal character of his experiments, and for their incomplete nature. Soon after taking from $1\frac{1}{2}$ to 2 gr. of cannabinol he felt a peculiar dryness in the mouth, and this was quickly followed by weakness in the legs, and by diminution in mental power, and a tendency to wander aimlessly about the room. He then became unable to fix his attention upon anything, and had a most irresistible desire to laugh. The tendency to laughter formed a prominent symptom throughout. In course of time he had ataxic gait and slurred speech. He had complete loss of time relation, and appeared to be living in the present, without a future or a past. There were frequently lucid intervals, which appeared sometimes to be the result of an effort of the will. During these he was able to converse in a fairly rational manner; but, as a whole, he was distinctly deficient in will power. He had a hazy notion of having been a rational being once, and wondered whether he should ever be so again. These symptoms gradually passed off, and three and a half hours after taking the drug he was able to walk home. The disordered sense of time, however, still persisted. The street seemed longer than usual, and its lamps almost interminable. Under the influence of fresh air and exercise he was gradually restored, and found appetite and power of sleep not impaired. Three weeks later he took $\frac{4}{5}$ gr. of cannabinol, and after four hours similar symptoms were produced. On this occasion, when his eyes were closed, he passed into a dreamy state, with visions of a grotesque character. Subsequently, Marshall employed this drug as a hypnotic, and it produced refreshing sleep which, however, was preceded by a disordered sense of time and subjective visions. Marshall thinks that it can be claimed for this substance that it is both active and pure, and that it may be possible to employ it as a hypnotic.

It is interesting to compare this account with that to be found in Wood's "Therapeutics" (p. 244), where many similar symptoms result from the use of cannabis indica. Most observers, working with the latter drug, have seen reason to be dissatisfied with the uncertainty of the effects to be obtained from the same doses. These uncertain results appear to be dependent upon alterations in the strength of the official preparations, and it may be a distinct advantage to employ cannabinol, if it can be procured in a pure form.

Kolanin is a glucoside which appears to be the active principle of the kola nut (*Berl. klin. Woch.*, June 21, 1897). It is said to restore the strength after exciting work without producing any ill effects, and in this action it has been thought to be superior to caffeine. It has also been used in cases of organic heart disease, and in migraine and headaches following upon mental over-exertion or upon alcoholic excess.

Euchinine has been introduced as a substitute for quinine, and it is claimed that it does not give rise to unpleasant secondary phenomena, such as giddiness and tinnitus. It also has the advantage of not causing nausea, nor of disturbing the appetite. Experience has shown that 2 gr. of the new preparation is the therapeutic equivalent of 1 gr. of quinine. Since euchinine is very insoluble, it is best given in doses of from 4 to 16 gr. in cachets or wafers. It may also be administered suspended in soup, cocoa, or milk (*Merck's Annual Report*, 1897).

According to **Von Noorden** (*Centralbl. f. inn. Med.*, 1896, No. 48) euchinine is at first perfectly tasteless, but later a slightly bitter taste is produced. In one case some numbness in the head followed a dose of 30 gr. Von Noorden finds that it lowers temperature in cases of intermittent or remittent fever. The hydrochlorate of euchinine has been used, but has an objectionable and persistent taste, which disadvantage is not possessed by the tannate. **Overloch** (*Deut. med. Zeit.*, 1897, No. 15) states that in exceptional cases slight ringing in the ears may occur after the first or second dose, but not subsequently. From this he argues that the drug has no cumulative effect—an advantage when frequent large doses are required, as in malaria.

Overloch considers that in future euchinine will be used when some special idiosyncracy prevents the employment of quinine. **Goliner** writes more strongly of his experiences of this drug (*Allgemeine med. Central-Zeitung*, 1896, No. 19), and does not hesitate to call it a valuable substitute for quinine, with excellent *antipyretic* and antineuralgic properties.

(*b*) *Hypnotics.*

Pellotin has been employed as a new hypnotic (see "Year-Book of Treatment" for 1897, p. 463). In 50 per cent. of the cases in which it was used by **Pilcz** (*Wien. klin. Woch.*, 1896, No. 48) it was found to produce sleep of a quiet character. In others, however, it was found to be wholly ineffectual. The beneficial effects were sometimes marked when other hypnotics had failed. Pilcz observed neither retardation of the pulse nor collapse, and he considers that the drug may be of value where other hypnotics fail, and points out that it can be used hypodermically.

Trional.

It is claimed for this drug that it will act as a satisfactory hypnotic and secure sleep in cases of pneumonia, bronchitis, alcoholism, and forms of nervous insomnia (*Brit. Med. Journ.*, March 27, 1897). It is usually taken in cachets, or suspended in hot milk or water. It possesses the advantage of permitting a gradual reduction of the dose; after the habit of sleeplessness has once been checked by 20 gr. or 24 gr. sleep may be procured by 15 gr. or less.

Benzacetin, which was lately employed as a sedative or soporific, has according to **Reiss** (*Therap. Monats.*, June, 1896) given relief in cases of habitual headache, neuralgia, and migraine, but in his experience it has not acted as a soporific.

Anesin (see p. 455) has been also used as a hypnotic, but appears to be of more value as a local anæsthetic.

Sulphate of duboisin has been administered both by the mouth and hypodermically by **Skeen** (*Journ. Ment. Sc.*, July, 1897), who usually employed doses varying from $\frac{1}{100}$ gr. to $\frac{1}{132}$ gr. He prefers the hypodermic administration in cases of excitement with hallucinations and delusions. He considers it gives good results as a sedative in all forms of insanity with excitement, but that it should not be used in debilitated persons. He has found that under its influence there may be weak pulse, tendency to faintness, and some ataxia, and also in some cases hallucinations of sight and hearing.

Hypnotics.

The treatment of insomnia was considered very exhaustively in the Section of Pharmacology and Therapeutics at the Montreal Meeting of the British Medical Association (*Brit. Med. Journ.*, Oct. 2, 1897). The physiology of insomnia was dealt with at great length by various speakers, some of whom dealt with the newer hypnotics. **Wilcox** called attention to the value of pellotin obtained from the *anhelonium Williamsii*, comparing his own experiences with those of other observers. With regard to

this drug, it was admitted that in full doses it might cause vertigo; which, however, was only noticed when the patient was not in a recumbent position. This paper included also some valuable remarks concerning sulphonal, trional, tetronal, urethane, and other new hypnotics, and it concluded with the following very useful classification of hypnotics:—

1. Potency: Paraldehyde, chloralamide, pellotin, trional.
2. Rapidity: Pellotin, paraldehyde, chloralamide, trional.
3. Duration: Trional (longest), chloralamide, pellotin, paraldehyde (considerable).
4. Habituation: Pellotin (slight), trional, chloralamide, paraldehyde (considerable).
5. Safety: Chloralamide, pellotin, paraldehyde, trional.

The course of the discussion upon insomnia and its treatment indicated a widespread distrust of the newer hypnotics. Each in turn was credited either with the formation of a "habit" or with more immediately recognisable deleterious effects; the only one for which some exception was made being paraldehyde, which, from its penetrating odour, was unlikely to be taken for any length of time without detection. Most speakers advocated some rational mode of dealing with the cause of the insomnia. Some of the methods suggested might provoke a smile, but as a whole the debate should do good service in indicating that the general feeling, even in the Therapeutic Section, was to seek for the cause of the insomnia rather than for specifics.

In closing the discussion, the President, **Leech**, admitted that in some cases it was impossible to avoid the employment of hypnotics. He summarised the arguments for and against the different remedies for insomnia, and emphasised the need of the avoidance of the routine employment of any single drug.

V.—Cardio-Vascular System.

Digitoxin (*Brit. Med. Journ., Epit.*, Feb. 20, 1897) in a crystalline form has been introduced by **Merck**, and appears to have the advantage of allowing definite doses to be employed. It is undoubtedly an active preparation, and it may, if given incautiously, produce toxic symptoms similar to those resulting from overdoses of digitalis. It may be destined to replace some of the ordinary preparations of digitalis leaves, which occasionally differ considerably in activity, but digitoxin is so active that great caution is necessary during its administration.

***Erythol* tetranitrate.**

This is obtained from erythrite $C_4H_{10}O_4$, a tetratomic alcohol

derivative of erythrine $C_{20}H_{22}O_{10}$, which is found in many lichens. It forms large scales, insoluble in cold water but freely soluble in alcohol. Like nitro-glycerine, it is liable to explode on concussion or with the application of sudden heat (*Merck's Annual Report*, 1897). **Bradbury**, in his Bradshaw Lecture at the Royal College of Physicians, called attention to the value of erythol tetranitrate in producing a persistent reduction of the blood pressure. From the clinical side **Burton** (*Brit. Med. Journ.*, April 3, 1897) gives details of two cases in which the drug was employed; in the first for the relief of asthmatic attacks of chronic nephritis, and in the second for the relief of cardiac pain. Burton finds that erythol tetranitrate produces little effect until half an hour after its administration. The maximum effect is produced at the end of an hour, and the action is continued until three hours after the dose. From this time the arterial tension begins gradually to rise, but does not return to its previous condition until about ten hours after the dose. With nitro-glycerine, however, reduction of arterial tension is seen at the end of five minutes, and the greatest effect appears in from half an hour to an hour. By the end of three hours the arterial tension resumes its normal condition. Burton lays stress on the importance of employing erythol tetranitrate in the solid form, since solutions may produce vomiting. These observations are supplemented (*Brit. Med. Journ.*, April 10, 1897) by the account of a medical man who employed this drug under the advice of Bradbury in the treatment of angina. This patient had previously employed both nitrite of amyl and nitro-glycerine, but derived a greater satisfaction from the use of erythol tetranitrate. Bradbury repeats that erythol tetranitrate was not introduced to replace amyl nitrite and nitro-glycerine in cutting short attacks which have developed, but as a substitute which might prevent the onset of the attacks.

VI.—Respiratory System.

Hydrastis canadensis has been recommended in the treatment of bronchial catarrh (*Centralbl. f. inn. Med.*, May, 1897). It was first employed by **Saenger** in early phthisis with hæmoptysis, and it was found to render the expectoration more fluid and less abundant. In cases of protracted bronchitis it has been found to diminish the impulse to cough, and to facilitate the removal of expectoration. The sedative action is said to be superior to that produced by opium or its derivatives. The liquid extract was used in doses of from 20 to 30 minims four

times a day, and it is asserted that the dose can be increased, if desired, since no harmful effects have been observed.

Pilocarpine.

Notwithstanding the value of its diaphoretic action, pilocarpine has lately fallen into disfavour, owing to the troublesome bronchial secretion which it excites. In connection with puerperal eclampsia, many writers recommend that it should not be employed. The suggestion made by **Bampton** (*Brit. Med. Journ.*, Jan. 16, 1897), to employ atropine as an antidote to pilocarpine is, therefore, one which is worth consideration. Bampton thinks that atropine has, in his experience, saved life by checking the excessive bronchial secretion provoked by pilocarpine.

It may probably cause some surprise to find that pilocarpine has been recommended to check excessive sweating (*Lancet*, Jan. 30, 1897). The doses which are stated to produce diminution of sweating are as small as $\frac{1}{30}$ to $\frac{1}{60}$ gr., and it is asserted that when employed in these amounts the unpleasant symptoms of pilocarpine — such as increased salivary flow and general depression—are not produced, while the night sweats of pulmonary tuberculosis are effectively controlled.

Naphthalene.

This drug has given a certain degree of satisfaction in the treatment of whooping cough (*Brit. Med. Journ.*, June 12, 1897), but it must be noted that tincture of belladonna and bromide of potassium were employed at the same time that naphthalene fumes were inhaled. Under this treatment, it was thought that the frequency of the paroxysms was much diminished.

Resorcin.

The local application of a 2 or 3 per cent. solution of resorcin to the chest has been stated to cut short the duration of most cases of whooping cough. This treatment, which was introduced by **Moncorvo** in 1890, has been practised by **Roskam** (*Ann. de la Soc. Méd. Chir. de Liége*, Feb., 1896). He thinks it important to wait until the initial congestive stage is past, and the whoop fairly established, before commencing the applications; and, in his experience, improvement generally shows itself within two or three days.

VII.—Digestive System.

Taka diastase is a ferment formed by the action of a fungus upon steamed rice, and is used in Japan under the name of *Koji* (*Merck's Annual Report*, 1897). It is a yellowish-white

hygroscopic powder, capable of rapidly transforming starch flour into maltose. It has, therefore, been recommended as an excellent remedy for some forms of indigestion (*Therap. Monats.*, 1896, No. 12; *Lancet*, March 13, 1897). It has been employed in doses of 2 to 5 gr., taken as wafers with meals, and is said to be especially valuable in cases marked by excessive acidity.

Bismuth sulpho-carbolate and bismuth oxybromide have been prepared and employed by **Hugh Woods** (*Brit. Med. Journ.*, Feb. 20, 1897), the former in cases of fever associated with irritative dyspepsia and fermentative changes in the food; the latter in dyspepsia associated with nervous derangements and in hysterical conditions combined with gastric pain and vomiting. Woods believes that both these compounds possess special advantages over older and better known forms of bismuth.

Chinaphthol is the name which has been suggested for a new compound of quinine with sulphonic acid and naphthol (*Wien. med. Blätter*, Nov. 19, 1896). It is said to be insoluble in acids, while it splits up under the influence of alkalies. It is therefore to be added to the long list of drugs intended for local action, and it is credited with beneficial results in typhoid fever and other conditions in which intestinal antisepsis is required. It would, therefore, be easy to enlarge the sphere of its activity.

Treatment of dysentery with monsonia.

John Maberly has recorded (*Lancet*, Feb. 6, 1897), results of treatment of 100 consecutive cases of dysentery with a plant which appears to have been largely used by the Hottentots and Bushmen of Cape Colony. This plant was eventually identified as the monsonia ovata, and it seems to have given satisfactory results in a large number of cases in which it was employed. Its action was somewhat uncertain, and this was attributed to the use of plants which were perhaps too old, and had lost some of their medicinal properties. In some of the cases other drugs were simultaneously employed; hence, although a strong case is made out in favour of monsonia, it is to be regretted it was not alone trusted to. Although some species of monsonia have astringent properties, Maberly is not disposed to attribute the therapeutic results to the presence of tannic acid, since the forms of monsonia which he employed are weak astringents, and have very little effect on ordinary diarrhœa. He considers that the plant has a specific action on the poison of dysentery, apart from any mere astringent properties (see p. 426).

VIII.—On the Kidney.

Strophanthus.

It is generally held that one of the chief distinctions between the action of digitalis and that of strophanthus lies in the diuretic action produced by the former. It is therefore interesting to find that strophanthus has lately been recommended for any condition where diuresis is required and could be promoted by increased blood pressure (*American Journ. Med. Sciences*, May, 1897). In the article referred to, **Wilcox** considers that strophanthus is indicated in rapid recurrence of cardiac systole, with diminished force and irregular rhythm, and also in Bright's disease when associated with prominent high arterial tension. He thinks that strophanthus should be avoided with advanced degeneration of the myocardium, or with much mechanical obstruction to the circulation from valvular incompetence. He claims for strophanthus that it has the following advantages over digitalis :—Greater rapidity of action, more powerful diuretic effect, absence of digestive disturbance, absence of cumulation, retention of efficacy after continuous administration, greater value in children, and greater safety in the aged. He recommends the use of 5 minims of the U.S.P. 5 per cent. tincture, and thinks this should not be given more than two or three times a day.

Diuretic action of salicylic acid and caffeine.

Salicylate of sodium, either in small or large doses, was found by **Siegert**, to diminish diuresis (*Münch. med. Woch.*, May 25, 1897). Caffeine produced markedly increased diuresis, but when given in conjunction with sodium salicylate this action was arrested. Siegert has found that these clinical results are confirmed by experiments on animals, in which salicylates will arrest diuresis produced by caffeine. On the other hand, the diuretic action of caffeine is considerably increased by the simultaneous use of digitalis, a fact which is sufficiently well known to clinical observers.

Cantharides in nephritis.—The tincture of cantharides in doses of 10 to 12 drops (*Thèse de Paris*, No. 24, 1896–97) has been found beneficial in acute infectious nephritis occurring in young people—a condition which is usually associated with anasarca. It is, on the other hand, contra-indicated in forms of interstitial nephritis, especially in connection with lead poisoning.

Deep injections of **ether** (2 c cm.) together with the administration of ether by the mouth, are recommended by **Gallois** (*Thèse de Lille*, 1897) in the treatment of uræmic dyspnœa, and he asserts that they produce marked diuresis within a few hours,

render respiration more easy, and promote sleep. In cases where the dyspnœa is due to pulmonary engorgement I have seen much advantage from the use of ether, which probably acts upon the heart and respiratory system primarily, rather than upon the kidney. It must be admitted, however, that under the name "uræmic dyspnœa" several distinct forms are included, and that some derive more benefit from the use of cardiac tonics, others from expectorants, and others, again, from diaphoretics and diuretics.

IX.—Constitutional and General.

"Opo-Therapeutics" is a name that has been suggested by **Landouzy** (*Rép. de Pharm.*, 1896, p. 163) as preferable to the term organo-therapeutics. The prefix is derived from ὀπός = juice or sap, and it has been suggested that this prefix might be used with a name indicating the gland from which the preparation has been obtained. According to this suggestion, the series of "opo" preparations would include substances derived from the thymus, thyroid, pituitary gland, kidney, spleen, testicles, prostate, and suprarenal capsule, as well as preparations obtained from red bone marrow. Most of these preparations have been employed during the year, but, with the exception of the preparations of the thyroid gland and perhaps of red bone marrow, it may be doubted whether they have generally given much satisfaction. The different preparations from the thyroid gland have, however, proved of service in a large number of different classes of disease, ranging from acromegaly to prurigo, psoriasis, and non-parasitic sycosis.

Thyroid has been used in prurigo by **Dobrowski** (*Sem. Méd.*, Oct. 28, 1896), who finds that under its influence irritation rapidly diminishes, but is liable to recur after the discontinuance of the drug. He considers, therefore, that although it acts as a palliative, it is not a certain cure.

Permanganate of potassium has been recommended in the treatment of lupus (see p. 357).

Thiosinamine has been employed as hypodermic injections in a case of keloid (*New York Med. Journ.*, March 20, 1897). From 15 to 20 minims of a 10 per cent. solution were injected repeatedly, and were followed by diminution both in the size and hardness of the keloids. In another case of deformity, resulting from extensive burn, marked increase in mobility ensued after the use of similar injections (see also p. 363).

The treatment of pleuro-peritoneal tuberculosis in children.

Tuberculous peritonitis has been treated in many ways, and most physicians feel somewhat hopeless with regard to prognosis. Various forms of iodine have been employed locally, and Scott's ointment has also been used. More recently ichthyol has occasionally been employed. **Professor Thoma**, of Geneva (*Lancet*, Jan. 16, 1897), recommends the employment of creosote in the form of enemata. He employs the formula recommended by Revilliod, the enema being prepared with water with a small quantity of almond oil and the yolk of one egg. He prefers, however, to administer cod liver oil with the creosote, and he uses 4 ounces of emulsified oil and 8 grs. of creosote during the first few days. The absorption of creosote is demonstrated by the dark discoloration of the urine. He only gives details of two cases in which this treatment was followed; on account of the family history, these cases came under observation at an early period, and were therefore treated promptly. Thoma recommends an extended time for this treatment.

Iodoform injections in tuberculous disease of the knee joint.

Two cases are reported (*Brit. Med. Journ.*, Aug. 4, 1897) which did well after the aspiration of synovial fluid and frequent injections of glycerine and iodoform into the synovial cavity. In both many other forms of treatment had been unsuccessfully tried, and in both the joints regained their natural form and mobility.

The **treatment of syphilis,** which was discussed at the Montreal meeting (*Brit. Med. Journ.*, Sept. 18, 1897) did not afford scope for the introduction of new remedies; the modes of employing mercury and iodides, and the stages appropriate to each were the chief points touched upon. It may be noted, however, that the discussion indicated some lack of unanimity concerning the value of intramuscular injections of soluble preparations of mercury. **Malcolm Morris** had not seen good results from this treatment, but it was praised by **Allan**, of New York.

Hæmols.

Compounds of hæmoglobin with various elements such as iodine, bromine, arsenic, copper, mercury, and zinc have been further investigated during the past year, and have been employed with some advantage over other compounds of these substances. With the exception of iodo-mercuro-hæmol, the literature concerning hæmols is entirely derived from foreign sources. ***Dixon Mann***, in the *Med. Chron.*, 1897, speaks well of the

compounds of hæmol with iodine and mercury in the treatment of various forms of skin disease connected with syphilis, and in cases of anæmic and weakly folk who need mercury he is disposed to prefer iodide of mercury hæmol to any other mercurial preparation.

Extract of leeches.

This preparation is, according to *Merck's Report*, an aqueous sterilised extract of the heads of *sanguisuga medicinalis*, hardened in alcohol, dried and pulverised. This extract retards the coagulation of blood, even in the living body, and it has therefore been suggested that it should be added to blood required for transfusion, and further that it might be employed to prevent recurrent thrombosis and infarct. Experiments have been made which tend to show that blood rendered non-coagulable by the addition of leech extract can be kept for a month without decomposing. These curious results are attributed to the increased vitality of the leucocytes, which, it is said, can be seen under the microscope to exhibit greater mobility and voraciousness than in normal blood.

The **absorption of iron** continues to attract interest. A summary of the recent investigations was published in the "Year-Book of Treatment" for 1897. Since then **Lépine** has made a further *précis* of recent work (*Sem. Méd.*, May 26, 1897), and he discusses the value of the hypodermic injection of a 10 per cent. solution of citrate of iron. This injection was found to cause pain, which was not produced by a 4 per cent. solution. Hypodermic injections of 3 c.cm. to 4 c.cm. of the 4 per cent. solution produced very marked improvement in a woman in whom treatment with bone marrow had caused no material change. Lépine calls attention to the need of caution in cases of kidney disease, since the hypodermic injection has produced anuria and even hæmaturia. He also gives warning against its employment in hepatic cirrhosis, hæmorrhoids, and other conditions associated with hæmorrhages.

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